# THE IRON AGE

Established 1855 | New York, October 20, 1910 | Vol. 86: No. 16

...ished Every Thursday by the

DAVID WILLIAMS COMPANY

14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.00 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

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## Railroad Buying Now in Sight

### No General Pig Iron Buying Movement as Yet

Some encouragement for the iron trade comes from Chicago. An important Western railroad company which suspended specifications last summer on 23,000 tons of rails that had been bought for delivery this year has now ordered shipment of these rails as well as of track supplies which had also been held up. An Eastern railroad company is in the market there for 30,000 tons of rails for prompt delivery. It is firmly believed in that city that the railroad companies will be permitted to make at least a slight advance in freight rates, and that this is the reason for the loosening up of railroad purchases. Prominent railroad officials have advised steel manufacturers in the past week that a much more liberal policy in placing orders for equipment is to be expected after the election next month, especially if financial conditions become easier. They will not wait until freight rate advances become a reality.

While reports from various sections of the country show some increase in business in all lines of finished products, with transactions now being consummated that could not have been done a few weeks ago, the situation at Pittsburgh appears not to have improved. In that center new orders and specifications on contracts for wire products, wrought pipe and sheets show a slight gain for this month over the corresponding period in September, but other branches of finished products are quiet, with, naturally, some feeling of discouragement. The market on steel billets at Pittsburgh continues weak. The large sale of Bessemer billets referred to last week was made by a Youngstown mill to an Indiana wire maker, shipments to be from 4000 to 7000 tons per month for six months.

The demand for pig iron is spasmodic. Orders for fairly heavy quantities, aggregating over 20,000 tons, have been placed by quite a number of manufacturers of cast iron pipe, and scattered sales have been made to other consuming interests in the several trade centers. The leading radiator interest has closed for probably 20,000 tons of Northern iron for several of its foundries, for deliveries from December to March. A New England foundry has taken 6000 tons to run through the first quarter. No general buying movement, however, has developed, consumers still purchasing for immediate requirements except in those instances in which they have been able to make contracts running into the early part of next year on the

basis of current quotations. More furnaces are receding from their demand for a premium over present prices on such deliveries.

Orders for structural material are below expectations, but a great deal of work is in sight both in the East and West, so that the trade is hopeful of better conditions in the near future. An interesting transaction is a contract placed by the United States Government with the Lackawanna Steel Company for 5000 tons of steel piling to be used in making the coffer dam for raising the Maine in the harbor of Havana. This is the second largest order ever placed for steel piling. Bids close October 31 on the new post-office building at the Pennsylvania Railroad Terminal in this city, which will require 14,000 to 18,000 tons of steel.

American iron and steel manufacturers continue to find the Canadian demand very satisfactory, especially for requirements for agricultural implement factories, some of this material taken by Canada going to the Australian trade.

Ferroalloys are weak. A sale is reported of foreign 80 per cent. ferromanganese at about $38.50, Baltimore, for deliveries extending through the first half of next year. Ferrosilicon is quoted at $54.50, Pittsburgh, for 50 per cent., for forward delivery.

Pig tin is higher, with some excitement among buyers. Ingot copper is again in quite heavy demand, with prices rising.

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## Keeping Contracts for Steel Products

An important matter considered at the meeting of the American Iron and Steel Institute in New York last week was that of contract obligations in the buying and selling of iron and steel. It is not a new question, but it is still a vexed and vexing one. It would seem that it has been enough talked about and that what is wanted now is a real effort to rid the business of abuses that both seller and buyer recognize, but have not done much to remove. We say seller and buyer, because for practically every failure to keep a contract there is also a failure in contract enforcement. Suits at law to compel a buyer to take out material according to the times and at the price stipulated are rare in the steel trade, and for reasons well known. Then, too, the manufacturing or consuming buyer of steel, as distinguished from the merchant buyer, is in turn a seller, and in his dual capacity may be guilty of both failure to keep and failure to enforce contracts.

It was admitted by the manufacturers of steel who took part in the discussion last week that the responsibility for the existing laxness in respect to contracts is not on one side alone. If buyers have refused to take out material on a falling market, either because they find they require less than they had counted on or, as more often happens, because the price has declined and they can buy at a less price elsewhere, it is true also that manufacturers, through their selling departments, have sold heavily without due regard to the ability of the buyer to consume within the contract period. What is worse, manufacturers have sold without regard to their ability to deliver; they have also been known to fail on deliveries to contract customers, on a rising market, while accepting early delivery business from others who gladly paid a premium. There is no doubt, moreover, that the guaranteeing of prices against declines is an important item in the manufacturer's responsibility for present conditions. These guarantees, as has been suggested, are one of the evils chargeable against the early period of the consolidation régime in the steel industry. Buyers argued at that time that natural laws were to a large extent inoperative—meaning that the unrestrained competition that had previously prevailed was gone—and that the prices asked were in a sense artificial. To stimulate demand under such conditions sellers booked large contracts to which guarantees were attached. As independent mills were established they in turn were compelled to give like guarantees. Further, the practice of making blanket contracts covering a buyer's requirements is chargeable in part with the abuses that are now plaguing the manufacturer.

The American Iron and Steel Institute will do a great service to both manufacturers and consumers of steel if it brings about a return to old-fashioned contract observance in the iron and steel trades. Its first task will be with its own members. It may almost be said that the matter rests entirely with the manufacturers. If they can do away with that type of salesmanship which sells without regard to the seller's ability to deliver or the buyer's ability to consume, they will have taken a long step toward the desired end. A further long step will be the keeping of contract deliveries by the manufacturer when markets are advancing.

It goes without saying that a greater degree of stability and evenness in prices would do much to solve the problem. The speculative element that figures so largely in the trade because of the great swings from low to high prices for steel and down again, is the arch disturber of contract relations. While something has been done toward cutting off the crests and filling up the troughs of our price waves, we must not count too much on abolishing the waves. What is doubtless possible, as was suggested at the Waldorf-Astoria meeting, is the shortening of the sale period, say to three months in the case of merchant buying and to six months as a maximum for manufacturing consumers. There may be exceptional cases in which manufacturing operations require yearly contracts, but there, as has been suggested, provision might be made for cancellations of unspecified tonnages by quarterly periods, with maximum and minimum amounts, the former not to exceed the latter by more than 25 per cent. Whatever the details of any reform plan that may be adopted, they will no doubt be based in general on two propositions that have been brought forward by the manufacturers, namely, short time contracts and the abolition of guarantees against declines. When the buyer has been prevented from buying beyond his requirements and on the other hand the seller has been kept from selling beyond his ability to deliver much will have been done toward the solution of the problem.

No action was taken by the manufacturers at last Friday's meeting, but it is likely that the views brought out at that time will eventually crystallize in the

report of a committee that will be charged with the whole question of contract reform.

## The Automobile Controversy

The chief point at issue regarding the economic phase of the pleasure automobile seems to remain hidden. It has not, as yet, appeared in any of the discussions bearing on that subject, advanced by either those interested in the continuation of the great demand for this class of vehicle or by pessimists who see naught but national ruin should investment in this most attractive means of locomotion continue to increase.

It matters little if a person with some accumulated means in either cash or property wishes to divert a part or the whole of such reserve into other channels. We have never stood aghast if our neighbor possessed a horse and carriage nor questioned his consistency when maintaining a means of deriving the benefits from any lawful recreation.

However, from a cold business viewpoint, the trouble with the automobile is not grounded upon the original investment at all but arises from its abnormal depreciation as compared with other machine devices, all the while having no earning capacity. The automobile stands alone in this unfortunate condition, and it rests with both the manufacturer and user to approach a rational zone and understand each other more fully than at present.

The average life of a motor car is three years, assuming that new designs or fashions do not result in the discard of the machine before that term expires into the hands of one interested in the second-hand class. This period of three years may be increased or diminished in consequence of the care given the various devices which compose the complete vehicle and the distance over which the car has been driven. The first cost, large or small, has but meagre influence upon the term of durability, although the milage may be greatly varied at the end of the period according to the purchaser's original outlay.

How is the rapid depreciation to be met and offset? First, by the makers leading instead of being led, and by a cessation of their efforts to produce a vehicle which will traverse roads of all kinds and conditions, up hill and down dale, at express speeds. Second, by users keeping in mind other features of a car than speed per unit of time and distances covered between dawn and twilight. A co-operation such as this would result in devices better adapted to long and reliable service and the elimination of the long distance idea which has all drivers by the ears.

A locomotive, after having been driven 150 miles over carefully aligned rails laid on a smooth road-bed, is taken into the round-house and looked over. The automobile is presumed to have the capacity of traveling thousands of miles with no inspection other than to note the cleanliness of spark-plugs and the amount of water and gasoline in their respective tanks.

The usual driver, skilled or otherwise, is incompetent to properly examine and adjust the parts in the present motor car, and the employment of those fitted to do so would transfer the charges against depreciation over to that of maintenance; thus the ultimate expense would not be changed at all, but a more enduring car might result.

To meet the future, engineers must design to avoid extremes in speeds of revolution and excessive pressures or stresses. The operator must be content with reasonable speeds and distances in a given time and look after the welfare of the car after use with a degree of intelligence possible with simplified mechanisms.

Thus, the term of usefulness will increase, to the detriment of the manufacturer possibly, by reason of a less output of new cars, and his plant will be operated but 60 hours a week, but his business will be steady and enduring, which cannot be said regarding present conditions or the outlook for the immediate future. In return for this sacrifice, if it may be so viewed, the purchaser will realize that his investment will return him some recreation, if nothing else, for a much longer term than at present in vogue. Before this can be brought about the entire industry and the ideas and expectations of users must receive a thorough renovation.

## The Quality of Boiler Tubes

At the convention of the American Boiler Manufacturers' Association in Chicago last week, as reported on another page, Secretary Charles S. Blake of the Hartford Steam Boiler Inspection & Insurance Company attacked the quality of boiler tubes. He asserted that the tube manufacturers do not seem to be keeping pace with the progress made by the manufacturers of other material entering into boiler construction and that "tube failures are woefully common." The average steam pressure 25 years ago ran from 80 to 100 lb., and "the tubes in use at that time," he said, "were identical in thickness, except in specific instances, with those in use to-day for pressures of 150 to 175 lb., and the average quality has not improved, so that the standard commercial tube of to-day is no better than, if as good as, the tube of those days."

Mr. Blake occupies too conspicuous a position to have his strictures passed over lightly. His assertions are evidently based upon the findings of the company's inspectors. If they have made such reports without thorough investigation, the manufacturers of boiler tubes are being grievously wronged. If, on the other hand, the facts are precisely as stated, the tube manufacturers should take steps to bring the quality of their product up to the requirements of the times.

## Cutting Tool Forms for Heavy Work

Builders of high power machine tools and makers of high speed steels assert that in many shops the old practice in types of cutting tools has been much too closely adhered to in adopting the new steels. The diamond point and other old styles, efficient tools with the common steels, are retained for heavy roughing cuts. The criticism is said to apply most strongly in the older manufacturing communities, though everywhere, probably, the minority and not the majority are the offenders. With metal planers particularly, a very blunt angled tool of the hog nose type is held to effect the best results, rather than tools with sharper cutting angles.

A well-known planer builder has made a great number of practical tests in his study of the question and has reached some interesting conclusions. Ac-

cording to his experience, the blunt angle tool requires more power to drive it than a form such as the diamond point. The latter rolls off long, unbroken chips, while the hog nose comes nearer to tearing off the metal, absorbing more power for the same degree of reduction. But with the blunt angle the steel stands up better. The theory is that the sharp angle generates a very high friction, causing the steel to heat unduly, until it burns and crumbles. With the blunt nose less friction follows, and the tool stands up much longer to its work, even when given a task heavier than is possible for the diamond point to perform. There is less replacement and grinding. In other words, the sharper angle may save some power, but is extravagant in tools. The angle recommended by this investigator is a cutting face practically perpendicular to the work and a clearance not exceeding 4 degrees. The soundness of the contention is accentuated by the fact that, as a result of practical experience rather than consistent test, a great many progressive works have adopted a type of tool similar to that described. Apparently no doubt exists that there should be a sharp differentiation in tool design, as between the two classes of steel and the work they are expected to perform.

### Nameless American Machines Abroad

In times past some foreign dealers have chipped the names of American builders from machine tools, and have sold them under their own nameplates. The practice has probably disappeared. Manufacturers very naturally discouraged it. The name of a well-constructed and well-designed machine is too valuable an asset to be surrendered for the aggrandizement of another. But the dealers abroad have never abandoned the idea of appropriating American built tools, names and all, and have endeavored to persuade manufacturers of good lines to do business with them on that basis. In a very few cases they have succeeded in securing high-grade machinery upon which no mark of identity exists except the dealer's nameplate. We doubt if the effort will meet with any adequate rewards for its originators. From the builders' point of view the transaction is distinctly disadvantageous. He may be released from direct responsibility to the customer, but that is a small matter if the machine is a good one. The reputation of machinery spreads rapidly. A tool in successful use in one shop usually results in sales to others. The maker is entitled to the full fruit of his labors.

## Correspondence

### Efficiency the Criterion for the Wage Rate

*To the Editor:* Your article in *The Iron Age* of October 13, headed "Paying the Workers," was a fine one; but so much of it as urges, in effect, that efficiency be the criterion for adjusting the wage rate, and as reprobates the practice of cutting rates on workmen, pleased me especially. These two things embody what I have been preaching to factory owners (and others) for years; but it is a doctrine to which the great majority of factory owners seem to be absolutely immune. The cutting of rates on the men is not only unprofitable, but it is extremely unjust; and my observation satisfies me that the exhibition by factory owners of the spirit of injustice which underlies the cutting of rates, is responsible for more than a few of our labor troubles.

The following incident illustrates these two points admirably, and in concrete shape at that. It recurred to me the moment I read your article. A couple of year ago, while in the heart of a unionized district, I called upon a large foundry and machine shop, and was surprised to find as superintendent an able man, but whose open shop principles were known of all men. My face must have evinced the surprise I felt, because he opened up as follows:

> Knowing me for the open shop advocate which I was and still am, you are surprised to find me occupying this position in this locality, are you not? I guess I'll forestall your questions by relating the facts.
>
> When I heard of the vacancy here and applied for the position, I rather expected to have my application turned down on account of my advocacy of open shop principles, though I knew the turndown would be couched in more or less veiled language. But to my surprise, they did not turn me down; on the contrary, they wrote that they were disposed to consider my application favorably, provided I would agree to take no step which might lead to a strike. Now they may have thought that this was a diplomatic way of disposing of my application, but, at any rate, I accepted their condition provided they would agree not to cut a wage rate I made until after they had discharged me; and we commenced on that basis a year ago and I'm here still and likely to remain quite a while.
>
> In the meantime I'm paying my skilled machinists and mechanics generally considerably more than the union rate which my predecessor paid; but my output shows a percentage of increase at least as great as the percentage which I'm paying above the union rate. And I need not tell you that any increase of wages which results in an increased percentage of output equal to the percentage of increase in wages is a very profitable proposition for my owners. Outside of this, my men have found at least one shop in which their "letting out a link" is premiumized by the owners, not penalized, as is mostly the case; hence my men are constantly on the lookout for ways and means in increasing their output. It is invariably recognized in concrete shape by me.

Now, on the other hand, I have found large shops where, for instance, two drill presses, side by side, running at the same speed and the same sized diameter drill, one on iron castings, the other on steel forgings, and both running at the same speed, with the drill boring steel forgings setting the pace, and, needless to say, both men receiving the same wage. Under the circumstances the drill running on iron castings should have been running at least 50 per cent. faster than the same sized drill on steel forgings, the result was the good worker was, in effect, being penalized and the poor workman was being premiumized.. Useless to look for good feeling or good results in a shop run on this plan. The men know, even if the owner does not know, when they are receiving a square deal, and the question as to whose fault it is is beyond the men. They do know that it does not pay in concrete shape to do their best, since those who don't receive the same pay.

The points you have raised in your article raise still another point, which is the question of intelligence, real intelligence. And the ignorant application of the individualistic principle makes the principle which is correct in itself seem as though it were at fault; it is the ignorant application of the individualistic principle, not the principle itself, which is the cause of the unrest which pervades the world of labor and eventuates in that rank fallacy, socialism. Real intelligence and the square deal are convertible terms, and real intelligence will reduce manufacturing costs quicker than anything else. A wage clipper is not intelligent, in most cases.

M. H. C. BROMBACHER.

NEW YORK, October 15, 1910.

### What Is "Invention"?

*To the Editor:* Apropos of the article on page 746 of *The Iron Age*, entitled "To Investigate the Patent Laws," in which you speak of "invention," if you can

give a practicable workable definition of that word you would confer a great favor on the Patent Office staff and all who may have dealings with them. About 16 years ago I was cited certain interferences from patents recently issued which I considered ridiculous, themselves being interfered with by such old and well-known (outside of the Patent Office) devices as the frame work of umbrellas, monkey on a stick toy, common double jointed gas brackets, &c., on which I requested a clear definition of the word "invention," on the basis of which the office was founded by act of Congress. In reply I was referred to "Walker on Patents," from which four quotations were sent me, as noted further on in the following extract from a recent letter to an English manufacturing company: "It may surprise you to learn that I was first to design, make and use the combination of rubber and hemp in packing for engine glands when a workman in Leeds,* but never thought of patenting anything at that time, and do not care to do it now, for I am convinced that a valid patent is an utter impossibility according to the dicta of 'Walker on Patents,' adopted as the rule of practice by the United States Patent Office staff. Neither Walker nor the United States or British patent offices can define the word 'invention,' yet they hold that 'a thing to be the subject of a patent must be an invented thing,' which is absurd when they cannot define the meaning of the all-important word. Also, 'The subject of a patent must possess novelty and utility, though these are not alone sufficient basis for a patent,' 'Application of an old device to accomplish new results is not patentable,' 'Aggregation is not patentable.'"

Now, if we define "invention" to mean a designing of some thing or form, differing from any thing or form in the realm of nature, invention is an impossibility, and "application" is the utmost that is left us, and that is tabooed by the Patent Office staff. Though letters patent are frauds, the system is probably the best yet devised to give to one applying some law or form of nature to accomplish certain effects, not previously known to the present generation or the art to which it is applicable, a chance to recompense himself for the benefits conferred on the community by the discoverer and publisher. JOHN W. PAYLER.

DETROIT, MICH., October 10, 1910.

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The Du Charme Wrench & Novelty Mfg. Company, Johnstown, Pa., manufacturer of Du Charme patented pipe wrenches, a quick acting pipe vise, fixture wrench, &c., has recently increased its capital stock from $25,000 to $50,000, to provide working capital to carry on a larger business. The company has recently contracted with two of the largest automobile builders to supply them with its patented turret wrench, one of which will be placed in every tool kit sent out with their automobiles. The company is about to manufacture a new combination roller chain pipe cutter and pipe wrench, having a capacity of from ⅛ to 4 in., inclusive. For cutting pipe ordinarily three different cutters would be required to secure the above range of sizes. The tool is intended for severe service and will sell at a popular price.

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The Canton Sheet Steel Company, which started to build a rolling mill at Canton, Ohio, in May, 1910, expects to have the plant completed and ready for operation in November. The plant is being equipped with six sheet, six pair and six annealing furnaces, five 38-in. hot and one 44-in. and four 24-in. cold trains of rolls, and three shears. It will have an annual capacity of about 20,000 tons of black and galvanized sheets.

* The time referred to was about 1867. The first patent on such combination was issued by the United States Patent Office in 1873, but whether designed on this side or imported by one who foresaw its financial possibilities better than I is unknown to me.

# Obituary

CYRUS H. WOODRUFF, a pioneer manufacturer in the West, died at the home of his daughter in Elgin, Ill., October 12, aged 91 years. He was born at West Stockbridge, Mass., spent his early years on his father's farm, taught school three years, and later engaged in the hardware business at West Stockbridge, where he also held the office of postmaster for 11 years. He became interested in a blast furnace at West Stockbridge, and also served two terms in the Massachusetts Legislature. In 1856 he disposed of his interests there and removed to Illinois, settling at Pecatonica, in the northern part of the State, later removing to Lena, Ill., where he engaged in the lumber business for a time. In 1862 he moved to Dundee, Ill., and became interested in the Illinois Iron & Bolt Works at Carpentersville. In 1868 he moved to Elgin, Ill., and established the Woodruff & Edwards Company, but retained his stock interest in the Illinois Iron & Bolt Company. He leaves two children, a son, Charles H. Woodruff, and a daughter.

MICHAEL BAACKES, one of the pioneers in the wire nail industry in the United States, died at Crefeld, near Duesseldorf, Germany, Tuesday, Oct. 18, aged 62 years. He had been in failing health for two years. Coming to this country from Germany in 1875 he soon became identified with the wire industry, and in the eighties was connected with the Covington, Ky., plant of the H. P. Nail Works, afterward of Cleveland. In the early nineties he organized the Baackes Wire Nail Company at Cleveland, of which he was the head. Several years later the company was absorbed by the Consolidated Steel & Wire Company, and Mr. Baackes continued to manage the plant. When the Consolidated works were taken over by the American Steel & Wire Company in the late nineties, Mr. Baackes retired. For the past seven years he has represented the United States Steel Corporation in special work in Europe. He was a brother to Frank Baackes, general sales manager of the American Steel & Wire Company.

ALBERT P. GAHR, vice-president and general manager of the E. A. Kinsey Company, Cincinnati, Ohio, one of the oldest machinery and supply houses in the central West, died October 13 of Bright's disease, aged 43 years. He was born in Madison, Int., but spent most of his business life in Cincinnati, entering the employ of the Kinsey Company about 20 years ago as manager of the railroad supply department, and at its reorganization, eight years later, was appointed to the position he held at the time of his death. He was a member of a number of prominent clubs. A widow survives him.

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The Treadwell Engineering Company, Easton, Pa., now owns and controls the plants of the Lebanon Steel Casting Company, Lebanon, Pa., and the Stoever Foundry & Machine Company, Myerstown, Pa. It has also leased the plant of M. H. Treadwell & Co., Lebanon. In addition it is erecting a new plant at Easton, which it expects to have completed this month. The company makes crucible steel castings at Lebanon. Its capital stock is $400,000, all preferred. J. H. Killinger is president, W. G. Farrell is vice-president, M. H. Treadwell is secretary and W. I. Gassert is treasurer.

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The Farrell-Cheek Steel Foundry Company has just completed the erection of one 1-ton special Bessemer converter at Sandusky, Ohio, and expects to have it in operation this month. It will have an annual capacity of about 1200 tons of steel castings. The capital stock of the company is $50,000. Herbert Farrell is president and general manager, J. O. Cheek is first vice-president, J. E. Sweet is secretary, J. T. Cheek is treasurer and P. J. Potter is general sales manager.

# International Trade in Iron and Steel

## Views Interchanged at the Meeting of the American Iron and Steel Institute—President Gary's Address

*(With Supplement.)*

The meeting of the American Iron and Steel Institute in New York, Friday, October 14, was the most notable gathering in many respects in the recent history of the steel industry. As was indicated in the preliminary publications concerning the meeting it was given an international aspect by the presence of representatives of the iron and steel industries of Great Britain, Germany, France, Belgium and Austria, whose names have already appeared in these columns. The headquarters of the institute for this meeting were at the Waldorf-Astoria, and Friday morning was given over to the registration of members and guests. The sessions were held in the Myrtle Room of the hotel, and were opened by the president of the institute, Elbert H. Gary, at 11 o'clock. The attendance then numbered about 200, and included representatives of practically every steel company in the country and of many important blast furnace and rolling mill companies. In welcoming the guests and in discussing the objects of the meeting, Judge Gary gave the address, which is given in full elsewhere in this issue.

### Co-operation in Foreign Trade

The first paper of the morning was by James A. Farrell, president of the United States Steel Products Export Company, on "Foreign Relations." It dealt specifically with the trade relations existing between iron and steel producers in the United States doing an export business and the producers of similar products in other countries who are also engaged in exporting a part of their product. The discussion, which traversed some familiar ground in dealing with the effects of hostile competition and the benefits of friendly relations between competitors, was participated in by E. C. Felton, president of the Pennsylvania Steel Company, Philadelphia; George W. Perkins, J. P. Morgan & Co., New York; E. Schaltenbrand, chairman of the Stahlwerks Verband, Duesseldorf, Germany; E. A. S. Clarke, president of the Lackawanna Steel Company, New York.

### Betterment of Labor Conditions

W. B. Dickson, first vice-president of the United States Steel Corporation, presented a paper on "The Betterment of Labor Conditions in the Steel Industry," which took up particularly questions of accident liability and the organization of the work of safeguarding employees against accidents. The paper also dealt with hours of labor, reiterating Mr. Dickson's views as given in his paper at the May, 1910, meeting of the institute on the matter of seven-day labor.

An intermission for luncheon came after the reading of Mr. Dickson's paper, and at the afternoon session it was discussed by Charles Kirchhoff from the standpoint of the Museum of Safety and Sanitation; by E. S. Cook, president of the Warwick Iron & Steel Company, Pottstown, Pa., who described the work done by his company among its foreign laborers and discussed the question of hours of labor at blast furnaces, and by Edward Bailey, president of the Central Iron & Steel Company, Harrisburg, Pa.

### Metallurgical Progress

An interesting paper which represented the technical side of the industry was read by Charles Kirchhoff, entitled "The International Metallurgical Congress of 1910 at Duesseldorf." It is given in full elsewhere. The paper was discussed by E. Schaltenbrand, who was one of the officers of the Duesseldorf Congress, and by Prof. Henry M. Howe. Herr Schaltenbrand, referring to Mr. Kirchhoff's statement that nothing revolutionary had been brought forward in the presentation of present practice in Germany, as made at the Duesseldorf Congress, called attention to the fact that new inventions are always attended by depreciation of existing plants. Furthermore, the progressive movements in steel manufacture are now so far international that no country can furnish any surprises. What is incumbent upon manufacturers is to work out in detail all the economies possible in their processes and in business methods. To that end he hoped that the American Iron and Steel Institute and its aims might make for progress, in harmony with the efforts of the various technical associations. Professor Howe congratulated the institute on the admirable review of progress the paper has presented and on having as a member one so well qualified to make it. He commented on the high plane of all the papers of the day, regarding the developments of the meeting as a striking manifestation of the same spirit which has compelled the creation of the Hague Tribunal.

### To Make Steel Contracts Binding

An important paper and one on a subject with which the institute is expected to deal in a practical way was that of Willis L. King, vice-president of the Jones & Laughlin Steel Company, on "Contract Obligations." The question is one that has been referred to repeatedly in these columns, and has been particularly pressed upon the thought of steel manufacturers in the past few years. The condition under which requirement contracts have been made for iron and steel products and the development of practices under which contracts have amounted simply to options to be exercised according to the choice of the buyer were taken up by the speaker and remedies suggested. Mr. King was followed by C. M. Schwab, president of the Bethlehem Steel Company; John A. Topping, president of the Republic Iron & Steel Company; Charles S. Price, president of the Cambria Steel Company; H. P. Bope, vice-president of the Carnegie Steel Company, and E. J. Buffington, president of the Illinois Steel Company. The suggestion came out in the discussion that a committee might well be appointed on this subject to draft standard forms of contract and to consider methods of abating the evils which have grown up under the plan of doing business followed in the past few years.

The papers of Messrs. Dickson, Farrell and King, together with portions of the discussions thereon, will appear in a later issue of *The Iron Age*, after those who contributed to these discussions have had opportunity to revise the stenographic report of their remarks.

### THE DINNER

A banquet attended by over 200 members of the institute and guests from other countries, given Friday evening in the grand ballroom of the Waldorf-Astoria, was a function of unusual brilliance. In the accompanying Supplement a view is given of the company after places had been taken.

The programme of after-dinner speaking was pre-

ceded by an interesting series of lantern slides and motion pictures. The slides gave an excellent idea of the stupendous work involved in the building of the steel works and the industrial city of Gary out of the scrub pines and sand dunes on the south shore of Lake Michigan, while the moving pictures showed vividly some of the spectacular processes involved in the manufacture of open hearth steel at Gary and the rolling of ingots into rails. Explanations and comments on the views were given by G. G. Thorp, vice-president of the Indiana Steel Company.

Judge Gary in opening the speaking programme said in part:

This is a momentous occasion. There are represented in this room the principal iron and steel manufacturers of America and also a very large percentage of the manufacturers of iron and steel of foreign countries; and in this day, when competition is so great the world over, when men are contesting for pecuniary success, when rivalry is not only emphatic but often destructive and many times bitter, we in this room advocate the gospel of peace and good-will. Our creed is the Golden Rule, and we practice what we preach. Many kind things have been said during the day concerning the United States Steel Corporation, and that corporation and its representatives have been generously given much credit; but I assure our friends from abroad that the great success of the United States Steel Corporation is largely dependent on and the result of the friendship and co-operation of other great steel and iron manufacturers in this country (applause). Whenever any question of great importance is to be considered, all the leading iron and steel men of this country cheerfully and promptly recognize any request for consultation and lend their influence and effort to the success of whatever object may be sought to be determined.

Charles M. Schwab was called upon by Judge Gary, and gave a warm welcome to the guests from abroad. He referred to the well-known iron and steel masters from across the water, who had been welcomed to this country when its steel industry was but an infant. There was a time when the mills in Europe and the United States were closed against all visitors; but to-day happily they are open to all.

### The New Era in Industry

Sir John Randles, chairman of the Workington Iron & Steel Company, Workington, England, made the first response for the visitors. He said that while some years ago Britons thought they were capable of running the globe so far as manufactures were concerned, and were disposed to think of Americans as hewers of wood and growers of corn and cotton, they now look with admiration on such production figures as Judge Gary presented in his address of the morning as representing the magnificent genius of the American people in iron and steel manufacture. One of the greatest changes in industry is in the attitude of its leaders. One day men entered upon industrial operations to acquire individual wealth—to "make their pile." To-day, speaking for himself and the amalgamation of industries he represented, he regarded himself as a trustee for the workers, in whatever capacity, and for every person who has put his savings into the industry. A change has come, also, in the attitude of manufacturers toward their competitors. The effort is now made to advance on lines of mutual understanding and to abandon the cut-throat or piratical policy. Concluding he said:

It has been the custom in our industries, when we meet, to discuss scientific and technical improvements. These are of value and of great importance, but it is always of value to remember that there is a commercial side which has to do with the market, which must take account of geography, which must take account of financial and even political considerations. All of these things will be attended to and thought of, I take it, by those who represent you in your great industry and by those of us across the sea who see in this new era possibilities in friendly co-operation which $17 steel cannot accomplish. We talk about the time of $17 rails, and you may do so if you like, but what does it mean? It means that when that policy of $17 rails was inaugurated it represented more misery than was caused by the bloodiest battle. It meant an industrial army laid aside and the workers deprived of their sustenance. It meant loss of industry that ought to have been maintained. It meant disaster worse than war. It was war in commerce and a régime which could not prevail. . . . There is no consideration too small to take into account in the development of markets and in the promotion of our common interests, so long as we do not overlap where we have no need to, so long as we do not conflict where we have no conflict. I believe our gatherings together in this manner will stop the destruction caused by the juggernaut of cheapness which strikes at the happiness of thousands of our fellows.

### Competition a Natural Law, But Needing Limits

Baron von Bodenhausen turned somewhat the current of thought of the meeting in saying that there are some things about competition that are not as bad as they may seem. One thing is quite certain, and that is that none of the great countries represented in the meeting would have won the standing it now has except that through competition it grew and developed, acquired health and strength, using its forces—its brains and its elbows—to fight its way through. He thought the laws in the United States, which prevent abolishing competition altogether, are healthy ones, being based on the very principles of Nature. Yet there are limits to such restrictions by law, limits beyond which such a law might become a curse. Nature may be depended on to suggest where to draw the line. In the growth of forest trees it must happen that some of the weaker ones will be turned down and overcome; but Nature never allows one tree to overcome them all. So the development of the strength of unit in industry must be with due regard to the strength of the community.

Taking up the question practically the speaker said that when business is declining it is difficult to know what one's competitors are doing. The great damage to the market is less from what one seller or his competitor is doing than from what one is told his competitor is doing. It is, therefore, necessary to know one's competitor, to be friendly with him and know what he is about. It is generally accepted that to know one's customers personally means half of his success; the speaker would say that to know competitors personally means the other half of business success. To have come together as the American and European manufacturers have done at this meeting would keep their competition sound and on a high level and within reasonable and natural limits. In concluding he referred to the tribute paid Judge Gary by his fellow steel manufacturers one year ago as the greatest honor ever bestowed upon a man by his competitors.

### An International Commercial Institute Suggested

Wilhelm Kaestranek, who was on the programme for the next response, was detained by illness. G. Scaby-Smith, managing director of Bolckow, Vaughan & Co., Ltd., Middlesbrough, England, was introduced, and referred to his visit in the early eighteen-eighties. Even at that time he and his associates were amazed at the rapid strides the American steel industry was making. On the question of friendly relations between steel manufacturers of the various countries, he said:

I understand your institute concerns itself more immediately with commercial questions. Our past intercourse with you has, I think, proved to us all that it is to our mutual advantage to meet and discuss these problems, which are of equal or greater importance than technical experiences. By doing this we not only enable the producer to have the advantage of the experience of the best appointed works, but we are able to exchange such information as to supply and demand as to prevent overproduction or undesirable scarcity, and hence possibly inflated prices. So far as the gentlemen present from England are able to represent the English views, I believe we are in accord with the idea that arrangements of this character are to the advantage of all. We have come here to learn and be instructed, and I trust that the result of our visit may be to draw us into closer relationship with you.

President Farrell will, I think, bear me out when I say that the European makers are generally prepared to take a reasonable view on all questions affecting their commercial

interests, and, on the other hand, I may say that we have always found the American equally reasonable. We hope that the bond of union inaugurated by the birth of your American Iron and Steel Institute will continue to exist and to extend. Possibly in the near future these gatherings may prove the need of an international iron and steel institute, at which the discussion of commercial and technical questions may be a feature. I am sure that a policy of friendly conference for the exchange of views and experience on such matters can do much to remove the sharpness of undue competition.

L. Spaak, representing the Belgian guests, expressed the hope that the New York meeting, by permitting of a comparison of views on commercial and technical questions, would make those participating in it better acquainted—all with a view to the promotion of amicable international relations and mutual cooperation. The new policy of reciprocal confidence which Judge Gary has brought into the steel industry has proved satisfactory in every direction. There is practically no situation in industry, as in other diplomatic relations, which cannot be solved by the application of this principle. The example set in the United States will be followed in time to come by all business men fully alive to their duty and competitors will learn not to look upon each other as enemies.

R. de Labriolle, speaking for the French representatives, spoke appreciatively of the good results likely to come from such an occasion, and paid a tribute to the foresight with which the affairs of the American Iron and Steel Institute are guided by its president.

E. Schaltenbrand, chairman of the German Steel Syndicate, responded happily in lighter vein, suggesting that as one result of his brief sojourn in New York he had almost made up his mind to open an office there and sell steel the rest of his life.

Wm. B. Peat, the last speaker, responded particularly for Great Britain as the source of some of the strains that had entered potently into American life. He enlarged eloquently upon what had been achieved here by the sons of those who had come over the sea and of their heritage of sound constitutions, healthy intelligence and indomitable perseverance. On the question to which the meeting gave prominence he said: "Unbridled rivalry in commerce unaccompanied by the courtesy of frequent conferences yields as its fruit bitterness between nations and unreasoning jealousy between individuals. We are here as comrades for the good of common industry and to foster friendship begun under such excellent auspices. The day is past when a policy of cut-throat competition is the best either for a country or for individuals. The day has arrived when good feeling between those engaged in competitive commerce will smooth over difficulties which may otherwise prove to be unsurmountable."

## EXCURSIONS

The first of the trips for inspection and the gathering of information concerning engineering and industrial operations was a tour of New York harbor. Members of the Institute and their foreign guests took the steamer Commodore at the New York Central's Pier 83, North River, near the foot of Forty-second street, Saturday morning at 11 o'clock. Going down the river the first stop was made at Ellis Island. Here the party landed, and spent some time in going about the United States Immigrant Station and in seeing the procedure followed in passing upon newly arrived immigrants. The course from Ellis Island was down New York Bay to Staten Island and into the Kill von Kull to Newark Bay. Returning by the same passage the boat proceeded to the Narrows, and thence along the Long Island shore of New York Bay to the Bush Terminal. A landing was made here for the inspection of the terminal. Thence the course was along the Brooklyn water front to the United States Navy Yard, then up the East River through Hell Gate into Long Island Sound. Turning back, the course was through the Harlem River and the ship canal to the Hudson River at Spuyten Duyvil, and down the Hudson to the starting point at Pier 83.

The special train for the tour to Buffalo, Gary, Chicago, Pittsburgh and Washington, as heretofore outlined, was taken at the Grand Central Depot Sunday evening, October 16. About 50 members of the Institute went on this excursion, making, with their guests, a party of 75.

### Attendants at the Dinner

H. E. Andrews, Col. Sir Charles Allen, John W. Alexander, M. Cochrane Armour.

Joseph G. Butler, Jr., William L. Brown, Frank Baackes, Oliver A. Blackburn, E. J. Buffington, Edward Bailey, Hon. Charles Brooker, John Penn Brock, D. Fairfax Bush, Henry N. Brinsmade, James A. Burden, Fayette T. Brown, Michael Blake, George Bartol, Robert Bentley, Raynal C. Bolling, T. J. Bray, Frank Billings, John G. Battelle, Horace A. Beale, Jr., Lowell H. Brown, Robert E. Brooke, H. P. Bope.

Clyde M. Carr, John B. Carse, L. E. Cochran, P. N. Cunningham, E. A. S. Clarke, Hiram S. Chamberlain, E. S. Cook, Otis H. Cutler, Bertrand D. Coleman, Theron I. Crane, George G. Crawford, J. J. Campbell, H. H. Cook, W. B. Crawford, Charles C. Cluff.

F. H. Daniels, William H. Donner, T. J. Drummond, W. B. Dickson, Charles Deering, Philip S. Dyer, George F. Downs, James H. Dempsey, H. G. Dalton, Edmund W. Dwight, Thomas Devlin.

Joseph Ellis, R. H. Edmonds, F. H. Eaton, J. S. Elverson.

Alvin J. Findley, E. C. Felton, J. A. Farrell, W. W. Finley, William E. Farrell, Henry S. Fleming, J. W. Fuller, Jr., Lewis W. Francis, B. F. Fackenthal, Jr., Arthur A. Fowler, W. J. Filbert, Joseph H. Frantz, W. K. Fleming, Thomas J. Foster.

Elbert H. Gary, James Gayley, Tracy W. Guthrie, E. G. Grace

O. N. Hutchinson, Harry E. Higgins, A. F. Huston, F. Hill, Dr. Eugen Herz, Prof. Henry M. Howe, F. Harlinghausen, W. T. Hildrup, Jr., George E. Holton, J. H. Hoyt, Edward M. Hagar, Frank Hitchcock.

Robert L. Ireland.

Jonathan R. Jones, W. L. Jones, Archibald Johnston, Joseph W. Jeffrey, Harry R. Jones, Alexander Jarecki.

Severn P. Ker, Frank G. Kennedy, Jr., Charles Kirchhoff, Willis L. King, Julian Kennedy, H. C. Kamp, David G. Kerr, I. A. Kelley, Thomas W. Kennedy, Fred Krebs.

R. de Labriolle.

Charles L. Miller, Charles F. Miller, Clinton S. Marshall, George F. McKay, Edmund W. Mudge, Thos. McDonald, F. W. Manson, E. F. Marston, George G. McMurtry, Cyrus H. McCormick, Alfred M. Mosscrop, Robert Mather, John Mitchell, C. H. McCullough, Jr., Daniel B. Meacham, Francis C. McMath, Charles MacVeagh, George Mesta, V. Mumford Moore.

Benjamin Nicoll.

Edwin N. Ohl, John O'Connor, Rudolph Ortmann, Edward O'Toole.

John O. Pew, Charles S. Price, William B. Peat, Charles P. Perin, George W. Perkins, Leonard Peckitt, Veryl Preston, Jay Morse Pickands, John A. Penton, Herbert F. Perkins.

W. A. Rogers, David Reeves, Wallace H. Rowe, G. Mure Ritchie, Sir John S. Randles, Charles F. Rand, R. W. Raymond, James H. Reed, John R. Russell, John V. W. Reynders, J. Leonard Replogle, Franklin B. Richards, C. Snelling Robinson, Theodore W. Robinson, Willis J. Root, Charles R. Robinson, John Reis.

Edward Shearson, William B. Schiller, Cameron C. Smith, Isaac M. Scott, E. Schaltenbrand, G. Scoby-Smith, Powell Stackhouse, Charles M. Schwab, L. Spaak, James Speyer, Carl Steven, T. Scott Smith, Harry J. Steel, Jr., James S. Stillman, William Durham Sargent, Arthur J. Singer, Charles J. Singer, Samuel B. Sheldon, Lewis A. Shepard, Richard B. Sheridan, Frank Samuel.

A. W. Thompson, T. Frame Thomson, E. Tonneau, John A. Topping, John M. Taylor, William H. Taylor, Moses Taylor, George G. Thorp, Rodney Thayer, W. A. Thomas.

J. Van Hoegaerden, Dr. Hugo von Noot, E. von Bodenhausen.

Walter Wood, Walter H. Whiteside, Ernest T. Weir, W. R. Walker, Edward H. Worth, W. P. Worth, P. A. B. Widener, W. L. Ward, George W. Watts, F. W. Wood, James C. Wallace, Charles P. Wheeler, George B. Wick, Hartley C. Wolle, E. C. Wallace.

E. M. Zehnder, Charles H. Zehnder, G. Zapf.

## INCIDENTS OF THE TOUR

CHICAGO, October 18, 1910.—The special train which left the Grand Central Station, New York, Sunday evening, bearing members of the American Iron and Steel Institute and their European guests, is considered the best appointed train ever sent out by the New York Central lines. It consists of seven compartment sleeping cars, one ordinary sleeper, two private cars, a buffet and smoker, an observation car, a diner and a baggage car. Schedule time was made to Buffalo, and the train was run upon a siding at the Lackawanna Steel Company's plant.

At 9 o'clock Monday morning a train of gondola cars provided with improvised seats took the party over the South Buffalo Railway Company's lines for an in-

spection of the steel works, visiting the by-product coke ovens first, and then, in turn, the gas engine blowing and power houses, rail mill and sheet bar mill. Four out of the seven blast furnaces were in operation. After two hours at the steel works automobiles were taken for a sightseeing trip through Buffalo, ending near the Black Rock Harbor improvements and barge canal lock, which will extend the water front available for lake vessels very considerably, giving a deep water channel in the Niagara River up to North Tonawanda, where the State's construction work on the barge canal ends.

Shortly after noon the special train started for Niagara Falls and the afternoon was spent in inspection of the turbine and electric generator plants on the Canadian and American sides which will have, after the installation of additional machinery now going in, a total of 479,000 hp. The trip through the gorge ended the day's sightseeing and the train left at 5.30 for Gary. The inspection of the Gary plant began at 9 o'clock Tuesday morning and was followed by an automobile ride through the town. The early afternoon was spent at the South Chicago works of the Illinois Steel Company and about 5 o'clock the special train reached the Twelfth street station, Chicago.

To-night a banquet is given at the Blackstone Hotel where the party will pass the night. Wednesday will also be spent in and around Chicago, Thursday and Friday at Pittsburgh and Saturday at Washington.

## Personal

A. Campion has resigned the position of secretary of the West of Scotland Iron and Steel Institute, Glasgow, and Ronald G. Jenkins, 124 St. Vincent street, Glasgow, has been appointed to fill the vacancy.

Major John M. Carson, chief of the Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C., sailed for Europe October 13, commissioned by President Taft to straighten out some of the tangles which now interfere with the growth of our exports.

Marcus A. Coolidge, president of the Fitchburg Machine Works, and John Bath of the Bath Grinder Company, both of Fitchburg, Mass., sailed last Saturday for Europe, where they will remain for some time on business for their companies.

Charles Adams, who was formerly superintendent of the Everitt-Metzger-Flanders Company's factory at Port Huron, Mich., has been made manager of production for all of the company's plants.

Rex E. Stafford, who has represented the Allis-Chalmers Company, with headquarters at Buffalo, recently severed that connection to become manager of the Long Grate Bar Company, Buffalo, N. Y.

Chas. S. Buell, who has been identified with some of the largest machinery manufacturers of the country as sales engineer, is now manager in Chicago for the Chandler-Taylor Company, with offices in the Western Union Building.

John O'Brien has resigned as night superintendent of the Mahoning Valley Works of the Republic Iron & Steel Company at Youngstown, Ohio, to become superintendent of the Manitoba Rolling Mills, Winnipeg, Manitoba.

Hugh D. Knox, New Castle, Pa., formerly connected with the Carnegie Steel Company, has been appointed chief chemist of the blast furnace plant of the Lackawanna Steel Company, Buffalo, N. Y.

R. H. Wolff, representative for the United States of the Heroult electric furnace, arrived in New York on Sunday from a sojourn in Europe of several months.

Several names have recently been added to the list of honorary members of the American Iron and Steel Institute and it now contains the following: J. Pierpont Morgan, New York City; James M. Swank, general manager American Iron and Steel Association, Philadelphia, Pa.; John Fritz, South Bethlehem, Pa.; Henry M. Howe, New York; Robert Forsyth, Chicago.

G. H. Duthie, formerly a foundryman and machine shop owner and manager, has accepted a position with the Thomas D. Prosser Company, Schmulbach Building, Wheeling, W. Va., and will travel throughout contiguous territory in the sale of its lines, which include pig iron, coke, &c.

Eli Joseph, president of the Joseph Joseph & Bros. Company, New York, has returned from Europe after an absence of several months.

E. R. Evinger, formerly with the National Automatic Tool Company, Richmond, Ind., has accepted the position of superintendent of the Miami Valley Machine Tool Company, Dayton, Ohio.

W. H. Cameron, chief engineer of the Willys-Overland Company, Toledo, Ohio, will sail for London, October 19, to attend the Olympia Show. While abroad he will tour the Continent for a month, visiting various automobile factories, and investigating foreign motor conditions generally.

James A. Campbell, president of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has been elected a member of the Board of Directors of the Lackawanna Steel Company, Buffalo, N. Y. The position also carries with it a place on the Advisory Board of the company.

John Woodward, general manager of the Leetonia Boiler Company, Leetonia, O., has resigned to accept the position of general manager of the Tulsa Boiler & Mfg. Company, Tulsa, Okla.

Press reports to the effect that John Warner and William Ward, formerly owners of the Empire Iron & Steel Company, sold out some months ago to the Garry Iron & Steel Company, also of Youngstown, would build a sheet mill between Struthers and Lowellville, Ohio, are officially denied by John Warner. Neither he nor Mr. Ward contemplates entering the sheet business again in the near future. Reports that the Ohio Iron & Steel Company, operating the Mary Furnace at Lowellville, Ohio, would shortly start the erection of an open hearth steel plant to roll billets, sheet and tin bars, are also untrue. Some months ago the Ohio Iron & Steel Company went into the matter of building an open hearth plant, but, owing to the high cost of materials and the long delays in delivery of machinery, the project was given up for the time being.

A charter has been granted the Reliance Steel Casting Company, Pittsburgh, with a capital of $200,000. The incorporators are Joseph A. Kelly, Pittsburgh; Charles Bailey, Oakmont, Pa., and E. A. Blasdell, Tarentum, Pa. This concern recently took over the plant of the Scaife Foundry & Machine Company, Pittsburgh. A 15-ton open hearth steel furnace has been installed, and the company will engage in the manufacture of a general line of steel castings.

Effective October 17, the wire and wire nail mills of the American Steel & Wire Company, at South Sharon, Pa., which heretofore have been under the jurisdiction of the Cleveland district office of that concern, will now be managed and the product sold from the Pittsburgh district office, located in the Frick Building and in charge of W. L. Hirsch, sales manager.

Maine has joined the list of steel-making States. The Portland Iron & Steel Company, at Portland, began the erection of a 25-gross-ton basic open-hearth furnace in 1909 and completed it last spring. Steel merchant bars and bars for reinforced concrete work are rolled.

# The Iron and Metal Markets

## A Comparison of Prices

**Advances Over the Previous Month in Heavy Type, Declines in Italics.**

At date, one week, one month and one year previous.

| | Oct.19, 1910. | Oct.12, 1910. | Sept.21, 1910. | Oct.20, 1909. |
|---|---|---|---|---|
| **PIG IRON,** Per Gross Ton: | | | | |
| Foundry No. 2, standard, Philadelphia | *$15.75* | $15.75 | $16.00 | $18.75 |
| Foundry No. 2, Southern, Cincinnati | 14.25 | 14.25 | 14.25 | 18.25 |
| Foundry No. 2, local, Chicago | *16.00* | 16.00 | 16.25 | 19.00 |
| Basic, delivered, eastern Pa. | 15.00 | 15.00 | 15.00 | 18.50 |
| Basic, Valley furnace | *13.00* | 13.10 | 13.50 | 17.00 |
| Bessemer, Pittsburgh | 15.90 | 15.90 | 15.90 | 19.90 |
| Gray forge, Pittsburgh | 14.15 | 14.15 | 14.15 | 17.15 |
| Lake Superior charcoal, Chicago | *18.00* | 18.25 | 18.25 | 19.50 |
| **BILLETS, &c.,** Per Gross Ton: | | | | |
| Bessemer billets, Pittsburgh | *23.50* | 24.00 | 24.50 | 27.00 |
| Forging billets, Pittsburgh | 29.00 | 29.00 | 29.00 | 30.00 |
| Open hearth billets, Philadelphia | *26.00* | 26.00 | 26.50 | 28.60 |
| Wire rods, Pittsburgh | **28.50** | 28.50 | 28.00 | 32.00 |
| Steel rails, heavy, at mill | 28.00 | 28.00 | 28.00 | 28.00 |
| **OLD MATERIAL,** Per Gross Ton: | | | | |
| Steel rails, melting, Chicago | 13.50 | 13.50 | 13.50 | 18.00 |
| Steel rails, melting, Philadelphia | *13.75* | 13.75 | 14.00 | 18.00 |
| Iron rails, Chicago | 16.00 | 16.00 | 16.00 | 20.50 |
| Iron rails, Philadelphia | 18.00 | 18.00 | 18.00 | 21.00 |
| Car wheels, Chicago | 14.00 | 14.00 | 14.00 | 18.25 |
| Car wheels, Philadelphia | 13.75 | 13.75 | 13.75 | 17.50 |
| Heavy steel scrap, Pittsburgh | *14.25* | 14.25 | 14.50 | 18.00 |
| Heavy steel scrap, Chicago | 12.25 | 12.25 | 12.25 | 16.50 |
| Heavy steel scrap, Philadelphia | *13.75* | 13.75 | 14.00 | 18.00 |
| **FINISHED IRON AND STEEL,** Per Pound: | Cents. | Cents. | Cents. | Cents. |
| Refined iron bars, Philadelphia | 1.40 | 1.40 | 1.40 | 1.60 |
| Common iron bars, Chicago | *1.35* | 1.35 | 1.37½ | 1.55 |
| Common iron bars, Pittsburgh | 1.45 | 1.45 | 1.45 | 1.65 |
| Steel bars, tidewater, New York | 1.56 | 1.56 | 1.56 | 1.71 |
| Steel bars, Pittsburgh | 1.40 | 1.40 | 1.40 | 1.50 |
| Tank plates, tidewater, New York | 1.56 | 1.56 | 1.56 | 1.66 |
| Tank plates, Pittsburgh | 1.40 | 1.40 | 1.40 | 1.50 |
| Beams, tidewater, New York | 1.56 | 1.56 | 1.56 | 1.66 |
| Beams, Pittsburgh | 1.40 | 1.40 | 1.40 | 1.50 |
| Angles, tidewater, New York | 1.56 | 1.56 | 1.56 | 1.66 |
| Angles, Pittsburgh | 1.40 | 1.40 | 1.40 | 1.50 |
| Skelp, grooved steel, Pittsburgh | *1.30* | 1.40 | 1.40 | 1.45 |
| Skelp, sheared steel, Pittsburgh | *1.40* | 1.50 | 1.50 | 1.55 |
| **SHEETS, NAILS AND WIRE,** Per Pound: | Cents. | Cents. | Cents. | Cents. |
| Sheets, black, No. 28, Pittsburgh | **2.20** | 2.20 | 2.15 | 2.30 |
| Wire nails, Pittsburgh* | 1.70 | 1.70 | 1.70 | 1.80 |
| Cut nails, Pittsburgh | 1.65 | 1.65 | 1.65 | 1.80 |
| Barb wire, galv., Pittsburgh* | 2.00 | 2.00 | 2.00 | 2.10 |
| **METALS,** Per Pound: | Cents. | Cents. | Cents. | Cents. |
| Lake copper, New York | **12.87½** | 12.87½ | 12.75 | 13.00 |
| Electrolytic copper, New York | **12.80** | 12.75 | 12.50 | 12.75 |
| Spelter, New York | 5.60 | 5.60 | 5.60 | 6.25 |
| Spelter, St. Louis | 5.45 | 5.45 | 5.45 | 6.10 |
| Lead, New York | 4.40 | 4.40 | 4.40 | 4.40 |
| Lead, St. Louis | *4.27½* | 4.27½ | 4.30 | 4.25 |
| Tin, New York | **37.62½** | .... | 34.55 | 30.40 |
| Antimony, Hallett, New York | *7.75* | 7.87½ | 7.87½ | 8.25 |
| Nickel, New York | 45.00 | 45.00 | 45.00 | 45.00 |
| Tin plate, 100 lb., New York | $3.84 | $3.84 | $3.84 | $3.74 |

* These prices are for largest lots to jobbers.

## Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala, 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

**Structural Material.**—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c. net.

**Plates.**—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

| | |
|---|---|
| Gauges under ¼-in. to and including 3-16-in. on thinnest edge | $0.10 |
| Gauges under 3-16-in. to and including No. 8 | .15 |
| Gauges under No. 8 to and including No. 9 | .25 |
| Gauges under No. 9 to and including No. 10 | .30 |
| Gauges under No. 10 to and including No. 12 | .40 |
| Sketches (including all straight taper plates), 3 ft. and over in length | .10 |
| Complete circles, 3 ft. in diameter and over | .20 |
| Boiler and flange steel | .10 |
| "A. B. M. A." and ordinary firebox steel | .20 |
| Still bottom steel | .30 |
| Marine steel | .40 |
| Locomotive firebox steel | .50 |
| Widths over 100 in. up to 110 in., inclusive | .05 |
| Widths over 110 in. up to 115 in., inclusive | .10 |
| Widths over 115 in. up to 120 in., inclusive | .15 |
| Widths over 120 in. up to 125 in., inclusive | .25 |
| Widths over 125 in. up to 130 in., inclusive | .50 |
| Widths over 130 in | 1.00 |
| Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive | .25 |
| Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive | .50 |
| Cutting to lengths or diameters under 1 ft. | 1.55 |

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

**Sheets.**—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 15 and 16, 1.95c.; Nos. 17 and 21, 2c.; Nos. 22 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.20c. to 3.25c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

**Wrought Pipe.**—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

| | Steel. Black. | Steel. Galv. | Iron. Black. | Iron. Galv. |
|---|---|---|---|---|
| **Butt Weld.** | | | | |
| ⅛, ¼, ⅜ in. | 72 | 58 | 68 | 54 |
| ½ in. | 75 | 63 | 71 | 59 |
| ¾ to 1½ in. | 79 | 69 | 75 | 65 |
| 2 to 3 in. | 80 | 70 | 76 | 66 |
| **Lap Weld.** | | | | |
| 2 in. | 76 | 66 | 72 | 62 |
| 2½ to 4 in. | 78 | 68 | 74 | 64 |
| 4½ to 6 in. | 77 | 67 | 73 | 63 |
| 7 to 12 in. | 75 | 59 | 71 | 55 |
| 13 to 15 in. | 51½ | .. | .. | .. |
| **Butt Weld, extra strong, plain ends, card weights.** | | | | |
| ⅛, ¼, ⅜ in. | 69 | 59 | 65 | 55 |
| ½ in. | 74 | 68 | 70 | 64 |
| ¾ to 1½ in. | 78 | 72 | 74 | 68 |
| 2 to 3 in. | 79 | 73 | 75 | 69 |
| **Lap Weld, extra strong, plain ends, card weight.** | | | | |
| 2 in. | 75 | 69 | 71 | 65 |
| 2½ to 4 in. | 77 | 71 | 73 | 67 |
| 4½ to 6 in. | 76 | 70 | 72 | 66 |
| 7 to 8 in. | 69 | 59 | 65 | 55 |
| 9 to 12 in. | 64 | 54 | 60 | 50 |
| **Butt Weld, double extra strong, plain ends, card weight.** | | | | |
| ⅛ in. | 64 | 58 | 60 | 54 |
| ¼ to 1½ in. | 67 | 61 | 63 | 57 |
| 2 to 3 in. | 69 | 63 | 65 | 59 |
| **Lap Weld, double extra strong, plain ends, card weight.** | | | | |
| 2 in. | 65 | 59 | 61 | 55 |
| 2½ to 4 in. | 67 | 61 | 63 | 57 |
| 4½ to 6 in. | 66 | 60 | 62 | 56 |
| 7 to 8 in. | 59 | 49 | 55 | 45 |
| **Plugged and Reamed.** | | | | |
| 1 to 1½, 2 to 3 in. Butt Weld | Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified. | | | |
| 2, 2½ to 4 in. Lap Weld | | | | |

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The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

**Boiler Tubes.**—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ in. | 49 | 43 |
| 1¾ to 2¼ in. | 61 | 43 |
| 2½ in. | 63 | 48 |
| 2¾ to 3 in. | 69 | 55 |
| 6 to 13 in. | 61 | 43 |

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

**Wire Rods.**—Bessemer, open hearth and chain rods, $28.50.

**Steel Rivets.**—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

## Pittsburgh

PARK BUILDING, October 19, 1910.—(*By Telegraph.*)

**Pig Iron.**—The largest sale of the week is one to a local consumer of 9000 tons of malleable Bessemer iron, deliveries being 750 tons a month over all of next year, at about $14, Valley furnace, or $14.90, Pittsburgh. The price is low, observing that deliveries run through the whole of next year, but it is stated that there were special reasons for taking the business. Bessemer iron is neglected, but several lots of basic, ranging from 1000 to 2000 tons, have been sold for delivery over the remainder of this year and into first quarter. We also note a sale of 2000 tons of foundry iron for November and December delivery at $14, Valley furnace. The nominal price of Bessemer is $15, with no business offering; basic is $13; No. 2 foundry about $14 and gray forge about $13.25, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

**Steel.**—The whole steel market is weak. Bessemer billets have been offered at $23.50, Pittsburgh, and declined. We quote Bessemer 4 x 4 in. billets at $23.50 to $24; open hearth 4 x 4 in. billets, nominally, $24.50 to $25; Bessemer and open hearth sheet and tin plate bars, $25; forging billets, $29 to $29.50, all f.o.b. cars, Pittsburgh, Youngstown or Wheeling district. Not enough new business is being offered in steel to test prices.

(*By Mail.*)

The new warehouses of the Carnegie Steel Company, at Twelfth and Pike streets, in this city, are about completed, and the company now has a number of salesmen covering the territory in the Pittsburgh district soliciting orders for plates, shapes, bars and other finished materials. The company also maintains similar warehouses at Waverly, N. J., St. Louis and Chicago. The general situation in the iron trade continues very quiet, with consumers placing orders only for such material as they absolutely need for current requirements, or to maintain complete stocks. Faith in the immediate future seems to be lacking, and there is, apparently, a feeling that an open market may come at any time, which would mean lower prices on nearly all lines of finished material than are now ruling. During the week basic iron declined squarely to $13, Valley furnace, and several sales have been made at that price. There is very little new demand for Bessemer, with the market nominally $15, Valley furnace, and a probability that lower prices would be made if any business were offering. The steel market is weak, and a recent sale of upward of 40,000 tons of 4 x 4 in. Bessemer rod billets by a Valley steel interest to an Indiana wire concern is exciting some comment in the trade. New orders and specifications for finished material in the first half of October were about the same as during the same period in September, but on wire products and sheets, also pipe, there has been a slight gain. The market on ferroalloys is weak and 80 per cent. foreign ferromanganese has sold at very close to $38, Baltimore, for first half of the year delivery. There is some inquiry out for foundry coke for next year delivery, and the Baltimore & Ohio Railroad has bought a round tonnage. The scrap trade is slow, with prices weak and inclined to lower values.

**Ferromanganese.**—The low prices ruling on foreign 80 per cent. ferromanganese are attractive to consumers and a fair amount of inquiry has come out in the past week. We note a sale of about 1500 tons of foreign 80 per cent., deliveries extending through first half of next year, on the basis of about $38.50, Baltimore, and a sale of 300 tons for similar delivery at the same price. There is not much inquiry for prompt shipment, consumers being pretty well covered for remainder of this year. We quote 80 per cent. foreign ferro at $38.50 to $39. Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

**Ferrosilicon.**—In spite of the low prices ruling for ferrosilicon, inquiry is light, and not much material is being sold. For prompt delivery, ferrosilicon is somewhat scarce and brings fully $1 a ton more than for forward delivery. We note a sale of a carload, or about 25 tons, of 50 per cent., for prompt shipment, at about $56.50, delivered, Pittsburgh. We quote 50 per cent. ferrosilicon for forward delivery at $54.50 to $55, Pittsburgh. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

**Skelp.**—The recent readjustment of discounts on iron and steel pipe to a lower basis is reflected in the skelp market, prices on which have gone off to some extent and are ruling lower in this market than for some mont'is. We note sales of about 2500 tons of grooved steel skelp and about 3500 tons of sheared steel skelp at the lowest prices reached in this market for some time. Revised price quotations are as follows: Grooved steel skelp, 1.30c. to 1.35c.; sheared steel skelp, 1.40c. to 1.45c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp, 1.75c. to 1.80c., all f.o.b. Pittsburgh, usual terms. It is stated that grooved steel skelp has recently been offered within $3 a ton as low as prices asked for Bessemer 4 x 4 in. billets.

**Rods.**—The larger consumers of rods are pretty well covered, new inquiry being light and mostly in small lots for prompt shipment. The market is firmer than for some time and we quote Bessemer, open hearth and chain rods at $28.50, Pittsburgh.

**Muck Bar.**—The Lockhart Iron & Steel Company, operating a muck bar mill at McKees Rocks, Pa., has signed the Sons of Vulcan puddling scale and its muck bar mill has started up. There is still a great scarcity of best grades of muck bar rolled from all pig iron, and very high prices are being obtained. One leading producer has sold in the past two or three weeks 3500 tons of strictly high-grade muck bar, made from all pig iron, on the basis of $31 to $31.50, Pittsburgh. Some Eastern muck bar, made from part scrap, is being offered in this market at $29 to $29.50. We quote best grades of muck bar made from all pig iron at $31 to $31.50, Pittsburgh.

**Steel Rails.**—No orders of moment have been placed for standard sections, and new orders for light rails in the past week were somewhat lighter than in any one week for some time, the Carnegie Steel Company having taken only about 2500 tons. Export orders for rails are coming in quite freely and a good part of the tonnage rolled at Edgar Thomson Rail Mills of the Carnegie Steel Company is for export trade. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

**Structural Material.**—Nothing definite has been heard regarding the letting of the contract for the Quebec bridge, and the contract for the Long Island Railroad elevated work has not yet been placed. The American Bridge Company has taken a bridge for the Pennsylvania Railroad east of this city, about 1200 tons. Specifications are expected in a few days for the Williamette River work in Oregon. A good deal of new work is known to be under way, but is being held up, and much of it will likely go over until next year. We continue to quote beams and channels up to 15-in. at 1.40c. in large lots and 1.45c. in small lots, f.o.b. Pittsburgh.

**Plates.**—Nothing further has been heard in regard to the reported inquiry of the Pennsylvania Railroad for 8000 to 10,000 steel cars; the inquiry has not reached the local steel car builders. There has been a dearth of car orders for some time, and all the leading steel car interests are cleaning up work on their books pretty fast. The Woods Run plant of the Pressed Steel Car Company will likely shut down about November 1, but the company has about enough orders to run the McKees Rocks works fairly full to February 1. The contract for the 2500 tons of plates for the new gas holder at Kansas City has not yet been placed. The whole plate trade is very dull and all the mills are badly in need of work. The local market on ⅛-in. and

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heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

**Sheets.**—The sheet trade is showing some betterment in the amount of new orders being placed and specifications are also reported as coming in a little more freely. Some of the sheet mills have entered some good sized contracts for delivery as far ahead as in the first quarter of next year. The market is based on 2.20c. for No. 28 black and 3.20c. for No. 28 galvanized, most of the tonnage recently entered being at these prices. Corrugated roofing sheets are $1.60 and galvanized $2.80 per square on No. 28 gauge, 2½-in. corrugations. The schedule of prices on black and galvanized and on roofing sheets is printed on a previous page.

**Tin Plate.**—Not much new business is being placed, this being the off season in the tin plate trade, but the mills are pretty comfortably filled through the first quarter of next year, and consumers are specifying fairly well against contracts, except in two or three sections, where specifications have fallen off and in some cases have been held up entirely. The market is firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

**Bars.**—Specifications against contracts on soft steel bars so far this month have been fairly good. New orders, however, are light and mostly in small lots. Low prices on iron bars are ruling in Chicago and other Western points, and in a good many cases some former consumers of steel bars are now using iron bars on account of the lower cost. The volume of new orders in iron bars is light, the railroads placing very little new business and not specifying very freely against contracts. We continue to quote soft steel bars at 1.40c. in large lots and common iron bars, 1.45c., Pittsburgh.

**Spelter.**—The market is firmer and prime grades of Western spelter are firm to-day at 5.40c. to 5.42½c., East St. Louis, equal to 5.52½c. and 5.55c., Pittsburgh. A sale of 50 tons is reported to a local consumer at 5.40c., East St. Louis.

**Hoops and Bands.**—A moderate volume of new orders is being placed and specifications against contracts so far this month have shown an increase over the same period in September. Prices are quite firm and we quote hoops at 1.50c. in large lots and 1.55c. in small lots; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter subject to extras as noted in the steel bar card, dated September 1, last year.

**Cotton Ties.**—We quote the market at 77c. per bundle for October shipment and 77½c. for November delivery.

**Spikes.**—New orders are very dull, the railroads only buying small lots of spikes needed for repair work. The volume of orders in small railroad and boat spikes is only fair, and all the spike mills are badly in need of orders. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

**Rivets.**—Consumers continue to place orders only for such quantities as are needed for actual wants and are not buying ahead. Regular prices are 1.90c. on structural rivets and 2c. on boiler rivets, but are shaded.

**Shafting.**—New demand is light and specifications against contracts have been unsatisfactory to the mills for some time, especially for the automobile and implement trades. Regular discounts on shafting are 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

**Wire Products.**—There is a more active new demand for wire nails than for some time and specifications against contracts are coming in at a very good rate. The Youngstown Sheet & Tube Company has started its wire nail mill at East Youngstown on double turn. Demand for cut nails is slightly better and prices are firmer.

**Merchant Pipe.**—The volume of new business in merchant pipe so far this month has been quite satisfactory, and the leading pipe mills report that they are pretty comfortably filled with business for some time ahead. Jobbers and consumers are taking in larger quantities of pipe and bookings of the mills in October will likely show a good increase over last month. The new discounts on both iron and steel pipe are printed in full on a previous page.

**Boiler Tubes.**—Some good sized orders for railroad tubes are being placed, but demand for merchant tubes is very dull and has been all this year.

**Coke.**—The Baltimore & Ohio Railroad has placed a contract for 15,000 to 20,000 tons of foundry coke with the Sackett Coal & Coke Company, deliveries running over first half of next year. There is some inquiry in the market for foundry coke for first half of next year. Output of coke in the Upper and Lower Connellsville regions last week was 350,315 tons, an increase over the previous week of about 5000 tons. We quote standard grades of blast furnace coke for spot shipment at $1.60 to $1.65 and for delivery over the remainder of this year at $1.70 to $1.75 per net ton, at oven. Standard makes of 72-hour foundry coke for spot shipment are held at $2.15 to $2.25 to consumers, and for delivery over the remainder of this year and into the first half of next year $2.25 to $2.50 per net ton, at oven, are being quoted.

**Iron and Steel Scrap.**—There is not much material moving from dealers to consumers, the latter buying only such quantities of scrap as are necessary to cover actual needs, not being satisfied that even present low prices will be maintained. The very low prices ruling on pig iron have a sympathetic effect on scrap, as a good many concerns are now using more basic iron than formerly, because of the low prices at which it can be obtained. Dealers state that while they are selling a fair tonnage to consumers, prices have reached such a low point that there is very little profit in these sales. The scrap list of the Norfolk & Western Railroad closes to-day (Tuesday), but very little of the scrap offered by this road finds its way into the Pittsburgh district. Prices on bundled sheet scrap, low phosphorus melting stock, cast iron borings and machine shop turnings are weak, and quotations on these grades are slightly reduced. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

| | |
|---|---|
| Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery | $14.25 to $14.50 |
| No. 1 foundry cast | 13.75 to 14.00 |
| No. 2 foundry cast | 12.75 to 13.00 |
| Bundled sheet scrap, at point of shipment | 10.00 to 10.25 |
| Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md. | 15.75 to 16.00 |
| No. 1 railroad malleable scrap | 13.50 to 13.75 |
| Grate bars | 12.00 to 12.25 |
| Low phosphorus melting stock | 17.50 to 17.75 |
| Iron car axles | 24.50 to 24.75 |
| Steel car axles | 21.25 to 21.50 |
| Locomotive axles | 24.50 to 25.00 |
| No. 1 busheling scrap | 12.50 to 12.75 |
| No. 2 busheling scrap | 8.50 to 8.75 |
| Old car wheels | 14.25 to 14.75 |
| Sheet bar crop ends | 15.75 to 16.00 |
| Cast iron borings | 8.00 to 8.25 |
| Machine shop turnings | 8.50 to 8.75 |
| Old iron rails | 16.00 to 16.25 |
| No. 1 wrought scrap | 15.00 to 15.25 |
| Stove plate | 11.75 to 12.00 |
| Heavy steel axle turnings | 9.75 to 10.00 |

We note sales of scrap as follows: 500 tons of No. 1 heavy steel scrap for Steubenville, Ohio, delivery at $14.40; 500 tons for Monessen, Pa., delivery at the same price; 1000 tons of cast iron borings at $8, Pittsburgh; 200 tons of heavy steel axle turnings at $9.80, Pittsburgh, and 800 tons of turnings at $8.25, Pittsburgh.

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P. G. Jenks and William Wieman, who have been identified for some time with Banning, Cooper & Co., Ltd., dealers in pig iron and coke, with offices on the fourteenth floor of the Oliver Building, Pittsburgh, have been admitted as members of that company, effective October 17. Mr. Jenks will be treasurer and Mr. Wieman, secretary. S. G. Cooper is president and C. F. Banning is chairman.

## Chicago

FISHER BUILDING, October 19, 1910.—(*By Telegraph.*)

The great controversy over freight rates which has disturbed the market for several months appears to have been settled. It is reported on good authority that an understanding has been reached between the railroads and representatives of public interests, with the approval of perhaps a majority of the shipping interests directly involved, in accordance with which the Interstate Commerce Commission will grant the railroads a liberal compromise. Announcement of final settlement is not expected for some time, as the thousands of tariffs which involve advances in rates, both in Eastern and Western territory, have been suspended until February 1. The understanding evidently reached is practically a settlement out of court, which is not unusual in litigation involving such large interests. It is conceded by representatives of the shipping interests that this statement of the case is substantially correct. An important Western road which suspended deliveries last summer on 23,000 tons of rails has now ordered prompt shipment, and will resume extensions and development work which was stopped when the controversy began. An Eastern road is in the market for 30,000 tons of rails for prompt shipment, and other developments in this line are expected in the near future. The general market, however, shows no increased activity. New business last week was light in nearly all

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lines of finished materials. Prices are firmly maintained by all the important mills, especially those which hold a large share of yearly contracts for bars. The plate mills are nearing the end of the business on their books, but it is expected that the large corn crop and other conditions will soon bring in liberal orders for cars from Western roads. Enough business to fill all the structural mills for months is pending in the building field, if the projectors of new buildings in the Western cities could finance their plans.

**Pig Iron.**—Interest in the pig iron market for the last month has been confined to a few large transactions in Northern iron which has gradually weakened under the pressure of buying interests and has been quoted lower recently than at any time since 1904. Last week, however, no important transactions are reported in this territory. It is understood that the leading radiator interest has closed for a large tonnage of local Northern iron, deliveries at Detroit, Buffalo and other Eastern plants. A considerable tonnage of high phosphorus Northern iron has been purchased at a lower price than the cost of Southern iron. It is understood that over 20,000 tons of Northern iron has been purchased by this interest for deliveries from December to March. The local demand for Northern iron is running in small lots for current delivery. The market for Southern iron remains very quiet. One sale of 1500 tons has been made for first half to a Milwaukee buyer, and a few other transactions have been closed. For the present Southern iron is under a handicap in this market, as the foundries can mix Northern iron and scrap at a lower cost. Although the beginning of the new year is practically only two months away, neither the Southern furnace interests nor the buyers in this territory appear anxious to contract for first quarter until more definite information is available in the financial world. The scrap market has been weak for the past month, in line with condition of the pig iron market. The following quotations are for October, November and December shipment, Chicago delivery:

| | |
|---|---|
| Lake Superior charcoal | $18.00 to $18.50 |
| Northern coke foundry, No. 1 | 16.50 to 17.00 |
| Northern coke foundry, No. 2 | 16.00 to 16.50 |
| Northern coke foundry, No. 3 | 15.75 to 16.00 |
| Northern Scotch, No. 1 | 17.00 to 17.50 |
| Southern coke, No. 1 | 15.85 to 16.35 |
| Southern coke, No. 2 | 15.35 to 15.85 |
| Southern coke, No. 3 | 15.10 to 15.60 |
| Southern coke, No. 4 | 14.85 to 15.35 |
| Southern coke, No. 1 soft | 15.85 to 16.35 |
| Southern coke, No. 2 soft | 15.35 to 15.85 |
| Southern gray forge | 14.60 to 15.10 |
| Southern mottled | 14.60 to 15.10 |
| Malleable Bessemer | 16.00 to 16.50 |
| Standard Bessemer | 17.40 to 17.90 |
| Jackson Co. and Kentucky silvery, 6% | 19.40 to 19.90 |
| Jackson Co. and Kentucky silvery, 8% | 20.40 to 20.90 |
| Jackson Co. and Kentucky silvery, 10% | 21.40 to 21.90 |

(*By Mail.*)

**Billets.**—The market is quiet, with only occasional inquiries for small lots. The ruling price of open hearth forging billets on small orders is $28, base, Chicago.

**Rails and Track Supplies.**—A leading Western railroad system, whose officials have been very active in the rate controversy, held up shipments last summer of 23,000 tons of rails, as well as a large tonnage of track supplies. This railroad has now given specifications for shipment of the suspended tonnage, both of rails and track fastenings, and it is expected that other Western roads will soon be in the market with good inquiries. An Eastern trunk line has inquired for 30,000 tons of rails, with the prospect that one-half of this tonnage, or possibly a larger share, will be open hearth rails from the Gary mill, for immediate or early shipment. A number of small orders were taken last week by Chicago mills, amounting to about 5000 tons. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

**Structural Material.**—Only two important contracts were reported closed in the West last week. One was for 1350 tons for shops of the Western Electric Company, at Hawthorn (Chicago), which went to Vierling, McDowell & Co. The other was for 500 tons for the Monroe street bridge, at Spokane, Wash., which was taken by the King Bridge Company, Cleveland, Ohio. The amount of fabricated work in prospect is increasing steadily. The Oregon Trunk Railway will need 2000 tons of bridge work in the near future for its new road in Oregon. The sanitary district of Chicago will be in the market soon for about 3000 tons of bridge work for four bridges across the Chicago River in the heart of the city. There are to be 200-ft. bridges to replace old ones of a shorter span, the sanitary trustees having decided to widen the river to 200 ft. between Van Buren and Adams streets. The leading mills are holding a firm price on plain material, although 1.35c., Pittsburgh, is still heard of from outside mills on light sections. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

**Plates.**—The sales managers of the plate mills are encouraged by the fact that new inquiries are appearing in the market for cars, all from Eastern roads thus far. The Boston & Maine wants 500 box cars, the Norfolk & Western 500 hoppers and the Delaware, Lackawanna & Western 500 box cars and 500 hoppers. It is expected that the enormous crop which has matured in the West will soon force the Western roads into the market with liberal inquiries for cars. Meantime, prices remain unchanged on plates, with a few Eastern mills quoting 1.35c., Pittsburgh, on narrow sizes. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

**Sheets.**—There is a fair amount of new business, especially in open hearth sheets, and prices are reported firm. The new differentials on galvanized sheets have encountered less opposition among buyers than was generally expected. In a few cases there have been objections, but not of sufficient force to change the situation. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.65c. to 3.75c.

**Bars.**—New business has been light the past week in all branches of the bar market. Specifications are very satisfactory on agricultural contracts, but the demand from other sources is not conspicuous at the present time. Bar iron is dull and there has been no material increase thus far in railroad buying. The demand for hard steel bars keeps the mills going, but does not accumulate business on the order books. In a few cases outside mills have sold soft steel bars on the basis of 1.35c., Pittsburgh, but the principal mills in the bar trade are holding firm at 1.40c. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

**Rods and Wire.**—The wire trade continues one of the bright spots in a dull market. Specifications during the first half of October are fully equal to the average for September, which was a very satisfactory month. There has been an increase over former years in the production of field fence, which now amounts to nearly 500,000 tons annually, and the fall trade has been very good. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

**Merchant Steel.**—Specifications from the agricultural trade for special lines of steel indicate very favorable conditions in that line of consumption, but in other directions the market is quiet. Sales from store have not been so active the past week, but a fair amount of business is being done.

**Cast Iron Pipe.**—Salt Lake City, Utah, has bought 1500 tons of water pipe from the leading cast iron pipe interest, for early shipment. The same interest has made sales the past week of about 1000 tons of culvert and water pipe to railroads. There is a fair run of routine orders, in 25 to 200-ton lots, chiefly from cities which bought early in the year, but require additional lots to complete their work. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

**Old Material.**—No indications of a revival in demand have appeared thus far in the scrap market. Prices are generally a little weaker, but values have been so low for several months that buyers have been taking into stock whatever material is offered them by dealers, apparently on the theory that scrap at ruling prices is as good as money in the bank. One buyer of steel scrap in this district claims to have a stock that would cover his needs for 8 or 10 months, but continues to purchase each month at his present rate of melting. This buyer recently took 1000 tons of steel scrap at $12, a little below the quality of regular heavy melting steel. A sale of 500 tons of rail crops was made f.o.b. the seller's plant at $13, equal to a little more than $13.50 with switching charges and brokerage add to the price realized. The embargo reported at the plant of the leading buyer of melting steel in this market has been raised and regular deliveries are being accepted again. The lifeless condition of the market is shown by the fact that no change has been made for several weeks in the prices quoted below. When any large buyer comes into the market for a

# THE IRON AND METAL MARKETS

round tonnage prices are usually pulled out of balance, and an active market is always erratic in price movements, but there has been no disturbance of this character for many months in the stagnant surface of the Chicago scrap market. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

| | |
|---|---|
| Old iron rails | $16.00 to $16.50 |
| Old steel rails, rerolling | 15.25 to 15.75 |
| Old steel rails, less than 3 ft | 13.50 to 14.00 |
| Relaying rails, standard sections, subject to inspection | 24.00 to 25.00 |
| Old car wheels | 14.00 to 14.50 |
| Heavy melting steel scrap | 12.25 to 12.75 |
| Frogs, switches and guards, cut apart | 12.25 to 12.75 |
| Shoveling steel | 11.75 to 12.25 |

The following quotations are per net ton:

| | |
|---|---|
| Iron angles and splice bars | $14.00 to $14.50 |
| Iron car axles | 19.50 to 20.00 |
| Steel car axles | 19.50 to 20.00 |
| No. 1 railroad wrought | 11.75 to 12.25 |
| No. 2 railroad wrought | 10.75 to 11.25 |
| Springs, knuckles and couplers | 11.50 to 12.00 |
| Locomotive tires, smooth | 17.00 to 17.50 |
| No. 1 dealers' forge | 10.50 to 11.00 |
| Steel axle turnings | 8.25 to 8.75 |
| Machine shop turnings | 7.00 to 7.50 |
| Cast and mixed borings | 4.75 to 5.25 |
| No. 1 busheling | 10.00 to 10.50 |
| No. 2 busheling | 8.00 to 8.50 |
| No. 1 boilers, cut to sheets and rings | 8.50 to 9.00 |
| No. 1 cast scrap | 12.50 to 13.00 |
| Stove plate and light cast scrap | 10.75 to 11.25 |
| Railroad malleable | 11.00 to 11.50 |
| Agricultural malleable | 10.50 to 11.00 |
| Pipes and flues | 9.00 to 9.50 |

## Philadelphia

PHILADELPHIA, PA., October 18, 1910.

No important transactions, either in crude or finished materials, have been reported during the week, and a waiting tendency is again becoming more pronounced. The movement in pig iron is still largely confined to the foundry grades, in which a decreased volume of business is to be noted. Steel making grades as well as rolling mill grades continue practically at a standstill. As a rule, however, prices are unchanged and are pretty firmly held at the present level. There has been little new business of any size in rolled steel products; in some lines orders are more numerous, but the tonnage involved is small, and producers in some instances are barely able to maintain the productive rate of 50 to 60 per cent. of their normal capacity. Eastern steel mills are now willing to admit the discontinuance of their recent scrap buying arrangement and several have been buying in the open market. There has been little business done in coke, which for prompt delivery is a trifle easier.

**Iron Ore.**—Absolutely no interest is being taken in the ore market. Neither offers nor inquiries are to be noted, a waiting policy being followed by both consumer and seller. Importations of foreign ore at this port during the week ending October 15 amounted to 35,301 tons, valued at $124,498.

**Pig Iron.**—Buying has again quieted down and transactions, since the recent heavy purchases of foundry grades, have been confined largely to small and moderate lots for delivery during the remainder of the year. The most active buyers as well as prospective purchasers are the cast iron pipe makers, who have taken some fair lots and are still in the market for further supplies. The bulk of the sales during the week have been in small lots, carloads up to those of a few hundred tons, the larger tonnages for delivery over the remainder of the year and, in instances, extending into the early months of 1911. While a number of producers are readily obtaining $16, delivered, for standard brands of No. 2 X foundry, for such delivery, buyers are able to do $15.75, delivered, for this grade in some of the well-known brands, for shipment during the remainder of the year. That consumers continue to make small purchases for prompt deliveries indicates that at least the moderate buyers have but little iron in their yards. Producers are making no effort to force sales, but appear satisfied, under the existing market conditions, to keep regular customers supplied with near future requirements. While there has been a fair amount of general inquiry, there is less coming from the large buyers and fewer fresh inquiries are to be noted for over the first quarter and half of next year. Southern iron is being offered for this year's delivery at $11 to $11.50, Birmingham, for No. 2 foundry, with but very light sales, the outside figure can be done for first quarter delivery, but there have been no sales reported. Small sales characterize the business done in Virginia foundry grades, which have been almost exclusively for delivery during the next three months, at $13.25, furnace, which is the usual minimum for either No. 2X or No. 2 plain foundry, although one seller is understood to have shaded that figure for early deliveries. There is still no demand reported for forge iron for rolling mill purposes, although some little iron of this grade has been sold to the pipe foundries; prices are nominally quoted at $14.50 to $14.75, delivered. The demand for the steel-making grades is practically at a standstill, the larger steel mills are curtailing deliveries on basic iron and smaller concerns have covered to a large extent for their requirements this year. Basic is nominally quoted at $15, delivered, and makers contend that any reduction made would fail to bring out any business. Low phosphorus pig iron has been uncalled for during the week and prices are unchanged. The following range of prices about represents the market for standard brands, delivered in buyers' yards in this vicinity during the remainder of the year and in some instances extending into the first quarter of 1911:

| | |
|---|---|
| Eastern Pennsylvania, No. 2 X foundry | $15.75 to $16.00 |
| Eastern Pennsylvania, No. 2 plain | 15.25 to 15.50 |
| Virginia, No. 2 X foundry | 16.00 to 16.25 |
| Virginia, No. 2 plain | 16.00 to 16.25 |
| Gray forge | 14.50 to 14.75 |
| Basic | 15.00 |
| Standard low phosphorus | 22.50 |

**Ferromanganese.**—Several small inquiries have developed from the steel casting makers in this territory, usually running in lots upward of 100 tons. No actual sales are reported. Quotations are unchanged, $39, Baltimore, about representing the market for either prompt or first half shipment.

**Billets.**—The demand shows little indication of improvement. Consumers continue to place small orders from time to time to cover immediate needs, but show no interest in tonnage for future deliveries. Specifications on old contracts still come out fairly satisfactory and these, together with current orders, enable mills to keep going at an unchanged rate. Eastern makers firmly maintain their recent quotation of $26, delivered in this vicinity, for open hearth rolling billets, and name $28, at Eastern mill, as their minimum for forging billets, the usual extras applying for high carbons and special sizes.

**Plates.**—Quite a large run of orders is reported by the mills, but the bulk of the business is very small individually and the aggregate is hardly up to the average. The absence of any sizable orders is particularly noticeable. A few fair sized inquiries are reported, but buyers hesitate when it comes to placing orders for forward needs. Makers in this territory hold prices firmly, 1.55c. minimum being maintained for carload lots delivered in buyers' yards in this territory.

**Structural Material.**—Very few contracts covering any tonnage have been taken, the demand being largely of a small, miscellaneous character. Several pretty fair jobs have been authorized, but contracts for structural work are still held up. The general demand continues irregular. Prices are being well maintained at 1.55c., delivered, for plain shapes delivered in buyers' yards in this vicinity.

**Sheets.**—Business has been somewhat better, orders received being larger and, in the majority of instances, accompanied with specifications and deliveries urged. Mills are more actively engaged and have a better range of work ahead. Prices are unchanged, Eastern makers naming the following range of prices for ordinary business for prompt shipment: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

**Bars.**—The demand continues quiet, both for iron and steel bars, recent business being almost of a retail character. Few inquiries for any tonnage are reported. Specifications are coming out somewhat more freely, however, although mills are unable to increase the recent productive rate. More determination to hold the recent range of prices is to be noted, refined iron bars being held at 1.40c., minimum, delivered in this territory, with steel bars quoted at 1.55c. to 1.60c., delivered.

**Coke.**—Business has been largely confined to odd lots for early delivery, and in some instances prices for spot foundry coke are easier, $2.15 to $2.35, at ovens, being named, although for reasonable delivery $2.25 to $2.50, ovens, is named, according to grade. A slight movement in spot furnace coke at $1.55, ovens, is reported; forward deliveries are quoted, however, at unchanged prices. The following range of prices is named, per net ton, for deliveries in buyers' yards in this vicinity:

| | |
|---|---|
| Connellsville furnace coke | $4.00 to $4.15 |
| Foundry coke | 4.50 to 4.75 |
| Mountain furnace coke | 3.60 to 3.75 |
| Foundry coke | 4.10 to 4.35 |

**Old Material.**—Eastern steel mills are now willing to admit the dissolution of the recent scrap buying arrangement upon advices received from the Government, and several of the mills have entered the open market. One consumer, who purchased quite freely last week, is now pretty well covered; another purchased 1000 tons of heavy melting steel at $13.75,

# THE IRON AND METAL MARKETS

while another consumer offers less than that figure, but has not been able to get any material at the price. Owing to inactivity at the mills requirements are not large and buying in the immediate future is not expected to be heavy. The rolling mill grades remain quiet, No. 1 forge is slightly easier and turnings have been bought at 25c. below recent quotations. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

| | |
|---|---|
| No. 1 steel scrap and crops | $13.75 to $14.25 |
| Old steel rails, rerolling | 16.00 to 16.50 |
| Low phosphorus | 19.00 to 19.50 |
| Old steel axles | 20.00 to 20.50* |
| Old iron axles | 26.50 to 27.50* |
| Old iron rails | 18.00 to 18.50* |
| Old car wheels | 13.75 to 14.25 |
| No. 1 railroad wrought | 16.25 to 16.75 |
| Wrought iron pipe | 13.00 to 13.50 |
| No. 1 forge fire | 11.75 to 12.25 |
| No. 2 light iron | 7.50 to 8.00 |
| Wrought turnings | 8.50 to 9.00 |
| Cast borings | 9.00 to 9.25 |
| Machinery cast | 14.00 to 14.50 |
| Railroad malleable | 13.50 to 14.00 |
| Grate bars | 12.00 to 12.50 |
| Stove plate | 10.00 to 10.50 |

* Nominal.

Charles L. Barrett, formerly president of Barrett & Lawrence, Inc., Bullitt Building, Philadelphia, Pa., and H. J. Hood, formerly sales manager for the same concern, have severed their connection with that corporation and have opened offices at 819 Witherspoon Building, in the same city, under the firm name of Barrett & Co., and will engage in the iron and steel business. They will represent in that territory the Lehigh Foundry Company, Fullerton, Pa.; Mt. Carmel Iron Works, Mt. Carmel, Pa., and Albion Iron Works, and will act as agents for Vickers Sons & Maxim, Elco high speed steel. These concerns were formerly represented by Barrett & Lawrence, Inc.

## Cincinnati

CINCINNATI, OHIO, October 19, 1910.—(*By Telegraph.*)

**Pig Iron.**—The local market is very quiet and reports received from other districts indicate that the same condition exists elsewhere. Local interests do not look for any improvement until after the elections next month. New inquiries figured on include 1100 tons of Southern foundry No. 2 for a central Indiana melter and one for 600 tons each of Northern and Southern foundry for a northern Indiana consumer, both for first half delivery. Purchases being made are only for small lots and for delivery the remainder of this year and first quarter of next. Practically no speculative buying is being done. The two Michigan inquiries totaling 1200 tons of high silicon iron are still pending, and the central Indiana order for 1500 tons of Southern foundry is also held up. For the remainder of this year $11 is generally quoted on Southern iron, and for first half delivery $11.50 is the ruling figure, but concessions have been made on some first quarter contracts. A number of furnaces in the Hanging Rock district are willing to take on this year's business at $14, and are said to be willing to extend deliveries into the first quarter at a small advance over this figure. An inquiry from a St. Louis melter for 2000 tons of Southern foundry for first half delivery is expected to be closed within a few days. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

| | |
|---|---|
| Southern coke, No. 1 foundry | $14.75 to $15.25 |
| Southern coke, No. 2 foundry | 14.25 to 14.75 |
| Southern coke, No. 3 foundry | 13.75 to 14.25 |
| Southern coke, No. 4 foundry | 13.50 to 14.00 |
| Southern coke, No. 1 soft | 14.75 to 15.25 |
| Southern coke, No. 2 soft | 14.25 to 14.75 |
| Southern gray forge | 13.50 to 14.00 |
| Ohio silvery, 8 per cent. silicon | 19.20 |
| Lake Superior coke, No. 1 | 16.20 to 16.70 |
| Lake Superior coke, No. 2 | 15.70 to 16.20 |
| Lake Superior coke, No. 3 | 15.20 to 15.70 |
| Standard Southern car wheel | 25.25 to 25.75 |
| Lake Superior car wheel | 22.25 to 22.75 |

**Coke.**—No activity in the coke market is expected here for some time. Spot furnace coke is still weak and sales are only for small lots. Some furnace coke is obtainable in the Connellsville district, for immediate shipment, as low as $1.50, but in the Wise County and Pocahontas fields, $1.55 to $1.65 are the ruling figures for spot delivery. Contract prices for future delivery range from $1.65 to $1.85 at oven. Foundry coke remains the same in all three districts, and is also a slow seller. For prompt shipment as low as $2 can be done on some brands, but the standard grades bring a premium of 10c. to 15c. per ton over this. Contract figures are unchanged and $2.25 oven is a fair price, with some of the special grades quoted higher.

**Finished Iron and Steel.**—The past few days have seen a slight falling off in the mill business, but warehouse orders are about the same. The average warehouse price on bars is 1.80c. and that on structural material 1.90c. There has been a reduction in the warehouse price of blue annealed sheets. No. 10 gauge sheets are quoted at 2.10c.; No. 12, 2.15c.; No. 14, 2.20c., and No. 16, 2.30c.

**Old Material.**—Continued dullness characterizes this market. No large amounts of either wrought or cast scrap are changing hands, as consumers of both are only buying small quantities, and dealers appear to be well stocked up and are not making any strong effort to pick up further lots of any kind of scrap. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

| | |
|---|---|
| No. 1 railroad wrought, net ton | $12.50 to $13.00 |
| Cast borings, net ton | 4.50 to 5.00 |
| Steel turnings, net ton | 6.00 to 7.00 |
| No. 1 cast scrap, net ton | 11.50 to 12.50 |
| Burnt scrap, net ton | 8.00 to 9.00 |
| Old iron axles, net ton | 17.50 to 18.50 |
| Old steel rails, gross ton | 14.50 to 15.00 |
| Relaying rails, 50 lb. and up, gross ton | 22.50 to 23.50 |
| Old car wheels, gross ton | 12.00 to 13.00 |
| Heavy melting steel scrap, gross ton | 12.00 to 12.50 |

At a meeting of the directors of the Cincinnati Iron & Steel Company, October 15, Jas. I. Stephenson was elected president, to succeed the late Edward H. Busch; H. C. Busch was elected vice-president and Jas. A. Sebastiani secretary and treasurer.

## Cleveland

CLEVELAND, OHIO, October 18, 1910.

**Iron Ore.**—Owing to the falling off in shipments boats operated by the shippers will be able to handle about all of the ore brought down in November, and some of the independent vessel managers are planning to have their boats make only one trip next month. It is not expected that the November movement will exceed 2,000,000 tons. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

**Pig Iron.**—The market has apparently settled down to another dull spell and practically no sales or inquiries are reported in this territory. The demand for shipment to points in the western part of Ohio and in Indiana and Michigan is less active than during the previous week or two, inquiries coming only from small consumers for lots of around 200 tons. While a limited number of larger consumers and some of the smaller ones have placed contracts for their foundry iron requirements for the first quarter or first half, the sales in this territory have been far from sufficient to constitute a general buying movement, and furnace interests are not looking for much activity within the next few weeks. Buyers generally are taking little interest in the market. They seem to feel that while prices are about at cost of production and are not likely to go lower, yet there is no indication that there can be an advance for some time, and they wish to hold off as long as possible in placing contracts for next year's delivery, preferring to wait until they can get a better idea as to what business conditions are to be after the first of the year. Some of the producers are adhering firmly to the position they took several weeks ago and are refusing to make quotations for first quarter and first half shipment at less than 50c. above the current market price for the last quarter. For prompt shipment and the remainder of the year we quote, delivered Cleveland, as follows:

| | |
|---|---|
| Bessemer | $15.90 |
| Northern foundry, No. 1 | $14.75 to 15.00 |
| Northern foundry, No. 2 | 14.25 to 14.50 |
| Northern foundry, No. 3 | 14.00 to 14.25 |
| Gray forge | 14.00 to 14.25 |
| Southern foundry, No. 2 | 15.35 to 15.85 |
| Jackson Co. silvery, 8 per cent. silicon | 19.05 to 19.25 |

**Coke.**—There is no demand for furnace coke and practically no inquiry for foundry grades. Furnace interests are not ready to buy for the first half of next year and foundries are mostly covered with contracts. Prices remain steady, with quotations unchanged. We quote standard Connellsville furnace coke at $1.60 to $1.70 per net ton, at oven, for spot shipment, and $1.70 to $1.75 for the remainder of the year. Connellsville 72-hour foundry coke is held at $2.10 to $2.25 for prompt shipment, and $2.25 to $2.50 for delivery through the first half.

**Finished Iron and Steel.**—Some of the agricultural implement manufacturers have been holding back their specifications on steel bar contracts in order to get the benefit of lower prices should any reduction be made, but they are now in need of the material and are specifying quite freely for their requirements. The outlook in the implement trade is very satisfactory and manufacturers are preparing for a large output for the coming season. Other conditions in

# THE IRON AND METAL MARKETS

finished lines show practically no change. Mill agencies are getting a good volume of orders, but they are all for small tonnages, and no large inquiries are coming out. Prices are firm at 1.40c., Pittsburgh, and the leading mills are adhering to that price on plates. The demand for structural material continues fairly active. Fabricators, however, are not buying round lots for specific work, but are placing more frequent orders for small tonnages as the material is needed for fabrication. Bids have been received for the Fowler eight-story building in Detroit, requiring 800 tons. Locally the only new work that has come out is a trestle for the American Shipbuilding Company at Lorain, requiring 100 tons, and a grade crossing elimination bridge to be built by the County Commissioners just outside this city, requiring 300 tons. The Detroit, Toledo & Ironton Railroad, which was figuring on considerable tonnage for bridge construction, has postponed this work until spring. The demand for sheets, both black and galvanized, continues fairly active. The new prices are being well maintained by the mills, but some price cutting is reported by jobbers on the heavier gauges of galvanized sheets, sellers in some cases giving buyers the benefit of the old differentials, thus giving consumers lower prices than they can obtain from the mills. This shading will be eliminated when the present contracts between the jobbers and mills expire. The demand for bar iron is somewhat more active, but prices are not firm. While 1.35c. to 1.40c., Cleveland, is the usual quotation, this could probably be shaded to 1.30c. on an attractive inquiry. The city of Cleveland has authorized the expenditure of $100,000 for cast iron pipe and special castings for the water works department. Bids will be asked for shortly for the pipe, aggregating about 3500 tons.

**Old Material.**—The demand is still very light and dealers have about given up expectation of any improvement before the first of next year. Prices are weak, but there is not enough business in several grades to make quotations more than nominal. Local mills are buying only in small lots as material is needed and the demand from the foundry trade is also light. Dealers with large stocks on hand are making no efforts to crowd this scrap on the market. Practically no inquiry is coming to local dealers for material to be shipped to other points. Dealers' prices per net ton, f.o.b. Cleveland, are unchanged, being as follows:

| | |
|---|---|
| Old steel rails | $14.00 to $14.50 |
| Old iron rails | 16.00 to 16.50 |
| Steel car axles | 20.00 to 20.50 |
| Heavy melting steel | 13.00 to 13.25 |
| Old car wheels | 14.00 to 14.50 |
| Relaying rails, 50 lb. and over | 22.50 to 23.50 |
| Agricultural malleable | 12.00 to 12.50 |
| Railroad malleable | 13.00 to 13.50 |
| Light bundled sheet scrap | 9.00 to 9.50 |

The following prices are per net ton, f.o.b. Cleveland:

| | |
|---|---|
| Iron car axles | $21.00 to $21.50 |
| Cast borings | 5.50 to 6.00 |
| Iron and steel turnings and drillings | 6.25 to 6.50 |
| Steel axle turnings | 8.75 to 9.00 |
| No. 1 busheling | 11.00 to 11.50 |
| No. 1 railroad wrought | 13.00 to 13.50 |
| No. 1 cast | 11.50 to 12.00 |
| Stove plate | 10.50 to 11.00 |
| Bundled tin scrap | 11.00 to 11.50 |

## Birmingham

BIRMINGHAM, ALA., October 17, 1910.

**Pig Iron.**—An improvement in sentiment is noted, but so far actual trade conditions are practically unchanged. The volume of business transacted the past week was comparatively small and it is quite probable that the tonnage placed was about equally divided between two producing interests. This was by reason of the refusal of others to meet a price of $11, Birmingham, for comparatively early deliveries, which price is apparently considered the market by the trade generally. The schedule of $11.50, Birmingham, for deliveries after January 1, next, has to all appearances been maintained for free iron. One producer reports the sale of approximately 7000 tons for shipment during the first quarter on a strictly $11.50 basis and report is made of unsuccessful efforts to place round lots for that delivery at a lower figure than has just been named. The recent trading in warrants has been light, although it is not understood that any such holdings have been withdrawn from the market. The demand for low grades for spot shipment was the feature of the market during the week and there is now a decided tendency to reduce the differential in price for grades below No. 4 foundry to 25c. per ton. Several small lots of forge and mottled for spot shipment are known to have brought a straight $11.50 basis within the week. So far, the early requirement of low grades by the leading melters has not taken more definite form, but there is known to be a material shortage of all grades below No. 3 foundry in the accumulations now on furnace yards, and the percentage of low grades being produced is very small. The largest single stock of No. 4 foundry in this district is being held firmly at $11, Birmingham, or at a No. 3 foundry price on a strictly $11.50 basis. The price named has so far proved prohibitive, but it is not likely that a concession will be made to move the accumulation. Another addition to the active capacity for foundry grades is to be made during the coming week.

**Cast Iron Pipe.**—The aggregate of small orders placed with producers so far this month is considerably under that expected, and without new contracts coming up the market is practically featureless. A leading interest announces orders now in hand to cover operations for another month, and the daily output is being moved. However, all producers are not so fortunate, and stocks are becoming much in evidence at the various plants. It is understood that the new plant for Norfolk, Va., will not be built for some time, and that the local plant for the manufacture of Universal pipe (which has been in competition with the regular bell and spigot pipe) will be dismantled, the equipment to be replaced with equipment for the manufacture of soil pipe. We quote nominally, with the market very inactive, at the following, per net ton, f.o.b. cars here: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12 in., average, $20.50, with $1 per ton extra for gas pipe.

**Old Material.**—Report is made of the sale of a round lot of several grades, but not without a concession on the part of the dealer in the matter of price. Practically no transactions of the regular order have been recorded during the week, and dealers' asking prices are more nominal than at the time of last report. By reason of the lack of interest manifested by the trade, prices have not been adjusted and the market is really in a very uncertain condition. We quote dealers' nominal asking prices as follows, per gross ton, f.o.b. cars here:

| | |
|---|---|
| Old iron axles | $15.00 to $15.50 |
| Old iron rails | 13.00 to 13.50 |
| Old steel axles | 14.50 to 15.00 |
| No. 1 railroad wrought | 13.00 to 13.50 |
| No. 2 railroad wrought | 9.00 to 9.50 |
| No. 1 country | 8.00 to 8.50 |
| No. 2 country | 7.50 to 8.00 |
| No. 1 machinery | 9.50 to 10.00 |
| No. 1 steel | 11.50 to 12.00 |
| Tram car wheels | 9.50 to 10.00 |
| Standard car wheels | 10.50 to 11.00 |
| Light cast and stove plate | 8.00 to 8.50 |

No. 1 furnace of the Birmingham Coal & Iron Company, Vanderbilt, Ala., plant will be blown in in the next week or 10 days.

The furnace of the Silver Creek Iron Company at Rome, Ga., which has been operated on charcoal for some months, has been blown in on coke. This is in order that a supply of charcoal for operations during next spring may be accumulated.

The plant of the Pan-American Mfg. Company, at Anniston, Ala., will be put into operation about November 1, making stoves and shelf hardware.

The plant of the Beggs Pipe & Foundry Company, at North Birmingham, Ala., has been put into operation, after having been closed down some months for repairs.

## St. Louis

ST. LOUIS, MO., October 17, 1910.

While general business, though lacking snap, appears to have a better undertone, the leading iron interests of the city do not count on any material improvement in conditions affecting their lines until after the November elections. Besides the Congressional elections, the uncertainty respecting the result of the State election on the prohibition amendment is exerting an adverse influence on business in the State in general and St. Louis in particular, especially as regards new enterprises and building operations. At the same time all the financial institutions report satisfactory conditions, and bank clearings for the week are again in excess of the same week last year. It is believed that, as the movement of the crops gathers in volume, the earnings of the railroads will enable them to come into the market more generally for supplies and equipment in the near future.

**Coke.**—The only large transaction reported is the sale of 1500 tons of by-product coke by one of the leading sales agencies, for shipment over the first half of 1911. Another office mentioned a sale of 18 cars of foundry coke for prompt shipment. The market is weaker, and we hear $2.20 named for Connellsville 72-hour foundry for contract and $2.10 per net ton at oven, for prompt shipment, with some special brands held higher. Nearly all the inquiries and the sales, which are mostly small lots, are for prompt shipment. Very little interest is shown by large buyers who usually make long time contracts.

**Pig Iron.**—A canvass of the various leading sales agencies developed that the aggregate sales of all the offices

# THE IRON AND METAL MARKETS

during the week would only make a fair business for any one of them, the largest showing made by any one house being 700 tons of different kinds of iron for various deliveries to several parties. Regarding inquiries, the following are reported: An inquiry for 500 tons of silicon 2½ to 3 per cent. for shipment over the remainder of the year; 500 tons of Northern No. 2 foundry, for shipment over the first half of 1911. Quite a number of tentative inquiries are being made and several bona fide buyers who have been in the market the past week or two have inquiries pending. A large business for the first half of 1911 could be done on the basis of prices for the remainder of the year. There seems to be a lack of confidence in the maintenance of the present stand made by sellers for a premium on 1911 iron. It is claimed that bankers are not favorable to iron collateral based on higher figures than those prevailing, accompanied by the usual margin. With respect to the market it is ruling unchanged at $11, Birmingham, for No. 2, Southern foundry, for shipment over the remainder of the year with special brands held 25 to 50c. per ton higher. For shipment over the first half of 1911, $11.50 is asked, with some furnaces limiting delivery to first quarter, and others asking $12.

**Finished Iron and Steel.**—Few inquiries are out for standard rails. The inquiry for light rails from lumber interests is not as active, but there continues to be a fair inquiry from coal mines. Structural material is in moderate request for prompt shipment. There is a fair demand for steel bars from wagon and agricultural implement manufacturers, but jobbers are not in the market to any extent. For track material there is only a hand-to-mouth buying.

**Old Material.**—A little increase in inquiry for foundry grades from consumers is noted by the leading dealers in scrap iron and steel, but the major part of the list is neglected. Cast scrap is a little stronger. There is a fair inquiry for relaying rails, though it is confined mainly to the heavier sections. No railroad lists were reported for the week. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

| | |
|---|---|
| Old iron rails | $14.00 to $14.50 |
| Old steel rails, rerolling | 13.00 to 13.50 |
| Old steel rails, less than 3 ft | 12.25 to 12.75 |
| Relaying rails, standard sections, subject to inspection | 24.50 to 25.00 |
| Old car wheels | 13.50 to 14.00 |
| Heavy melting steel scrap | 12.00 to 12.50 |
| Frogs, switches and guards, cut apart | 12.25 to 12.75 |

The following quotations are per net ton:

| | |
|---|---|
| Iron fish plates | $12.00 to $12.50 |
| Iron car axles | 18.50 to 19.00 |
| Steel car axles | 18.50 to 19.00 |
| No. 1 railroad wrought | 12.00 to 12.50 |
| No. 2 railroad wrought | 11.00 to 11.50 |
| Railway springs | 11.00 to 11.50 |
| Locomotive tires, smooth | 16.50 to 17.00 |
| No. 1 dealers' forge | 10.00 to 10.50 |
| Mixed borings | 5.00 to 5.50 |
| No. 1 busheling | 10.50 to 11.00 |
| No. 1 boilers, cut to sheets and rings | 9.00 to 9.50 |
| No. 1 cast scrap | 11.50 to 12.00 |
| Stove plate and light cast scrap | 9.00 to 9.50 |
| Railroad malleable | 9.00 to 9.50 |
| Agricultural malleable | 8.50 to 9.00 |
| Pipes and flues | 9.50 to 10.00 |
| Railroad sheet and tank scrap | 9.00 to 9.50 |
| Railroad grate bars | 8.00 to 8.50 |
| Machine shop turnings | 7.75 to 8.25 |

The Charles G. Stifel Estate is erecting a $100,000 building of six stories on Third street and Lucas avenue. It will be a strictly fireproof structure, will be equipped with two electric elevators and supplied with its own heating plant and sprinkling system.

The Santa Fe Railroad is erecting at Topeka, Kan., a general office building, which is to cost $250,000. It is to be seven stories at present, although the construction will be such that as many more stories can be added later.

## Buffalo

BUFFALO, N. Y., October 18, 1910.

**Pig Iron.**—The week has shown a large aggregate of inquiry for 1911 deliveries, and includes some round lots of foundry grades and a moderate amount of malleable. The total of orders placed, however, does not cover any considerable percentage of the aggregate of inquiries, denoting that there is still a good deal of "shopping" being done by the various buying interests, with more passive than active regard to getting business closed. The United States Cast Iron Pipe Company still has inquiries out in this market for good sized tonnages, with only limited placements so far. Notwithstanding the fact that so many consumers are holding off placements, orders amounting to about 15,000 tons, foundry grades, with a small sprinkling of malleable, have been placed during the week, the bookings being made for deliveries for periods of from three to eight months. Sellers are not urgently seeking business for 1911, as prices obtainable are below cost in many instances, and they are holding aloof from extended delivery sales. It is difficult to quote prices, with business running as at present, with a minimum variation of values between the various grades, furnacemen being inclined to concede grades to accord with customers' wishes. We quote the following as representing the market as accurately as possible under these conditions, f.o.b. Buffalo, for deliveries extending over the next six months:

| | |
|---|---|
| No. 1 X foundry | $14.75 to $15.25 |
| No. 2 X foundry | 14.50 to 14.75 |
| No. 2 plain | 14.25 to 14.50 |
| No. 3 foundry | 14.00 to 14.25 |
| Gray forge | 14.00 to 14.25 |
| Malleable | 14.75 to 15.25 |
| Basic | 14.75 to 15.25 |
| Charcoal | 18.50 to 19.00 |

**Finished Iron and Steel.**—Inquiries in finished products are more numerous. Jobbers' stocks in cold rolled steel and in some sections of hot rolled are apparently becoming low and orders are coming in quite freely for immediate requirements. Small shapes and some sizes of structural are also in demand for stock. Prices are unchanged and firmly held for steel bars and plates and shapes. There has been a noticeable development recently in the demand for iron bars owing to some extent to the firming tendency in steel bars. The export trade to Canada continues extremely good, with heavy demand for agricultural implement material, some of this material taken by Canada going to the Australian trade. In fabricated structural material there is something of a slowing down in demand. Business in structural plates and shapes continues in fairly good volume. Bids are being received this week for steel for a stock house for the Iroquois Brewing Company, about 200 tons, and plans are being prepared by the Lake Shore Railway Company for a four-track lift bridge with 80-ft. channel opening over the Buffalo River, Buffalo requiring about 800 tons of steel. The H. C. Harrower Iron & Steel Works, Buffalo, was low bidder for the steel for the Haberstro store and loft building on Broadway this city, 270 tons.

**Old Material.**—In general features the market is about the same as last week, although there is a little improvement in some lines, with better feeling and more activity, particularly in old car wheels and cast bearings, for which better prices are obtainable. The aggregate of sales in any line, however, has not been large. We quote as follows, per gross ton, f.o.b. Buffalo:

| | |
|---|---|
| Heavy melting steel | $12.00 to $12.50 |
| Low phosphorus steel | 17.00 to 17.50 |
| No. 1 railroad wrought | 14.00 to 14.50 |
| No. 1 railroad and machinery cast scrap | 13.25 to 13.50 |
| Old steel axles | 17.50 to 18.00 |
| Old iron axles | 23.00 to 23.50 |
| Old car wheels | 13.75 to 14.25 |
| Railroad malleable | 13.00 to 13.25 |
| Boiler plate | 10.00 to 10.50 |
| Locomotive grate bars | 10.50 to 11.00 |
| Pipe | 10.50 to 11.00 |
| Wrought iron and soft steel turnings | 6.75 to 7.00 |
| Clean cast borings | 6.25 to 6.50 |
| No. 1 busheling scrap | 11.25 to 12.00 |

## San Francisco

SAN FRANCISCO, CAL., October 13, 1910.

The Pacific Coast market for most lines of finished products continues dormant. Business in San Francisco is probably quieter than elsewhere. The only new feature is a slight reduction in prices by local merchants, following a similar movement on the part of the Eastern mills. The jobbing trade is considerably below normal for this season. Except for one fairly large transaction in rails, new orders booked by mill interests are confined almost entirely to small lots. There are, nevertheless, a number of encouraging features in the outlook, as several large building projects are coming into the market within the next few months and some new rail business is coming up. Prospective requirements of cast iron pipe are large, and the prospects of the oil industry are rapidly improving. There is a strong demand for agricultural implements, and in view of the large crop returns this year it is expected that the manufacturers will soon be in the market for supplies.

**Bars.**—The continued apathy on the part of large consumers of soft steel bars is hard to understand, but so far the movement has been confined to narrow limits. The distributive business is fair in some quarters, but by no means satisfactory, and it has not been possible to make any great reduction in the stock on hand. Manufacturers through the country have been buying foreign bars to some extent and probably hold a larger tonnage than has been generally known. There is a fair movement of reinforcing steel, but this is purchased mostly in small lots, and foreign material is being used to some extent for this purpose. It is stated by importers that their unsold accumulations in warehouse do not amount to over 800 tons. On foreign bars to arrive

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they are quoting 1.67½c. to 1.70c. by sailing vessel or 1.77c. by steamer, and a base price of 1.78c. on carload lots for immediate delivery from warehouse. Following the downward tendency of the Eastern market, local merchants have made a slight reduction in prices, quoting 2.25c. for iron and 2.45c. for steel. There has, however, been no tendency toward indiscriminate price cutting, the quotations being firmly maintained on all distributive business.

**Structural Material.**—The situation has not changed materially, most of the fabricators being fairly well occupied with small contracts, while several large jobs are to be given out within a few days. Some new work is also expected shortly at Los Angeles and the principal cities of Oregon and Washington. The volume of local work in hand has not increased materially and no new inquiries of special importance have come up, though a number of plans for large buildings are getting into shape for figuring. Contracts will probably be let in a few weeks for a lot of municipal work, and the Oakland City Hall will be in the market before long. The Masons will erect a large building at Sacramento, Cal., early next year. Arrangements are being made for the construction of the new Alcazar Theater in this city, and plans are being made for a nine-story hotel at Turk and Mason streets. The Levy estate is considering plans for a large theater and office building in Oakland. The plans of the Southern Pacific Railroad for improvements at the Sixteenth street station, Oakland, are announced, and include a large station building, with an elevated track, which will probably require a heavy tonnage of steel. Beams and channels, 3 to 15 in., from store, San Francisco, are quoted at 2.70c.

**Rails.**—An order for 12,000 tons for the San Pedro, Los Angeles & Salt Lake Railroad, booked by the Colorado Fuel & Iron Company, brings a material increase in the coast tonnage, though the transaction was not closed through the San Francisco office. Aside from this, there is considerable business in view. The Pacific Electric Railway of Los Angeles is planning to lay heavier rails on a part of its system. The California Harbor Commission has placed a contract with the Pennsylvania Steel Company for track supplies for the San Francisco waterfront line, and bids will be opened November 16 for rails for the municipal road on Geary street. A lot of new track will be laid during the coming year in the electric suburban system of the Southern Pacific. The Mojave & Bakersfield Railroad Company has been organized by officials of the Southern Pacific, the object being either to construct a new line between the points named or to double track the present road over Tehachapi Pass. The distance in either case will be about 85 miles and the work will probably be carried out in a short time, as traffic is badly congested on the present line.

**Plates.**—There is little movement, aside from deliveries on old contracts, and new bookings are falling below the average. Manufacturers of tanks and riveted pipe are keeping very busy, however, and no discouragement is felt regarding the outlook. There is a steady inquiry for riveted pipe for irrigation and reclamation work, and many tanks are being installed for consumers of fuel oil. In view of the large orders placed during the second quarter the movement for the entire year will probably show some increase, notwithstanding the recent dullness.

**Merchant Pipe.**—The continued dullness of the jobbing trade can only be explained on the ground that consumers as well as merchants have been carrying heavy supplies, which they wish to dispose of before entering the market again. The consuming trades, though dull locally, have been active in the interior, yet sales are on about the same small scale as last month. Jobbers are buying in a very conservative way for immediate needs, and are unlikely to require any heavy tonnage for the remainder of the year. Their prices have been shaded in proportion to the recent reduction announced by the mills. The demand for oil pipe is still small, but shows a slight increase since last month. The disposal of surplus oil and the improved condition of the industry have resulted in a renewal of interest in development, and work on new wells will probably be resumed on a large scale next spring.

**Cast Iron Pipe.**—Nothing of unusual interest has occurred in the local market, though the movement is increasing a little and several fair inquiries are coming out for municipal work. The city of Santa Cruz, Cal., is in the market for 1950 ft. of 10-in., 1850 ft. of 8-in. and 3500 ft. of 4-in. pipe, and small orders will be placed shortly by the towns of Modesto and Sisson, Cal. Probably the most important item in the coast trade for the coming year will be the pipe for the Bay Cities Water Company of Oakland, which is starting active construction on its system. This company has purchased a small lot from stock for emergency work, and is expected to enter the market at any time for its principal requirements. As the system will cover the entire city of Oakland with pipes adequate for domestic use and fire protection, the tonnage will be largely in excess of that ordered for the San Francisco fire protection system. The city of Eugene, Ore., has ordered a large lot of 4 and 6 in. pipe, and Tacoma, Wash., will be in the market shortly for a lot of 12 and 16 in. pipe.

**Pig Iron.**—Aside from heavy deliveries of Chinese iron at Irondale, Wash., on old contracts, there is little activity anywhere on the coast. A few foundries in the interior and at north and south coast points are getting a fair volume of work, but local melters are discouraged over the present situation and are buying practically nothing. Local quotations are as follows: Chinese, $23; Continental, $23; English, $23 to $23.50; Scotch, $25.

**Old Material.**—The only movement of any consequence at present is in cast scrap, even this being comparatively quiet. The demand is limited, but as supplies are closely cleaned up prices are firm. No shipments of steel melting scrap are being made at the moment. There is not much on hand, but in the absence of any local demand the market is weak, in sympathy with Eastern conditions. Little railroad wrought is being offered. Old rails are dull, with little demand from local rolling mills, and there is apparently some pressure to sell. Prices are quoted as follows: Cast iron scrap, per net ton, $18 to $19; steel melting scrap, per gross ton, $9; railroad wrought scrap, per net ton, $14; rerolling rails, per net ton, $15.

## New York

NEW YORK, October 19, 1910.

**Pig Iron.**—The volume of business in pig iron is larger, but so far no general buying movement has developed. The cast iron pipe interests have been by far the most prominent in making purchases for forward delivery. It is estimated that within the past week over 20,000 tons has been taken by several Eastern pipe manufacturers, some of which is for delivery in the early part of next year. Scattering purchases have been made by foundries in this vicinity and in New England, one taking 6000 tons to run through the first quarter. A feature of the situation is the acceptance of business running into next year by a few more pig iron manufacturers on the basis of prices for this year's delivery. The feeling is becoming stronger that November will see a greatly increased buying movement. It is somewhat noteworthy that sellers are now finding shipments ordered on contracts on which deliveries had been held up for some time. We quote for tidewater deliveries as follows: Northern No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.50.

**Finished Iron and Steel.**—While the present dullness has been accentuated by the persistent withholding of railroad orders for supplies and equipment, it is felt that this only means much heavier buying later. Already the railroads are showing more disposition to come into the market and this, with the reports of excellent crops, encourages the belief that general business conditions will shortly improve, which must have the effect of increasing activity in the iron and steel trades. Prices are firmer and, although transactions closed in the past week have not been numerous, it is largely because deliveries in all lines are good and purchasers do not feel the necessity of ordering far ahead of their requirements. Even steel bars can now be had in 10 days or two weeks as a rule. This trade is receiving liberal specifications on contracts and does not look for much new business before the next buying season, which is December. In the bar iron market it is evident that sentiment has improved, but so far orders and prices have not. The movement in plates is about the same as for the last few weeks but the structural material business closed in the past week has been particularly light. The New York Edison Company placed an order for a transformer building on 140th street, requiring 300 tons, with Levering & Garrigues. The Baltimore & Ohio has let two bridges, one of 400 tons to the McClintic-Marshall Construction Company and one of 200 tons to the American Bridge Company. The latter company also has an order for 600 tons from the Atchison, Topeka & Santa Fé. A highway bridge at Spokane, Wash., 400 tons, has gone to the King Bridge Company. For an addition to the Hochschield, Kohn & Co. store at Baltimore, the Chesapeake Iron Works will furnish 1300 tons of steel. The Knickerbocker Portland Cement Company, Hudson, N. Y., has placed an order for 450 tons for a new building, but it is not reported to whom. Bids close October 31 on the new post-office building at the Pennsylvania terminal in New York. It is variously estimated that 14,000 to 18,000 tons of steel will be required. The general contract for the Washington Irving High School, New York, has been placed with John T. Brady, but the steel has not yet been let. The George A. Fuller Company is asking bids on about 1000 tons for in-

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creasing the hight of the Knickerbocker Trust Company building from the present 9 to 22 stories. Quotations continue as follows: Plain structural material, plates and steel bars, 1.50c. to 1.61c., and bar iron, 1.45c. to 1.50c., all New York.

**Cast Iron Pipe.**—Although no public lettings of importance are in sight, inquiries from private gas and water companies are a great deal more numerous, and many of the largest buyers are feeling the market for next year. A much better feeling pervades trade circles. While carload lots of 6 in. are quoted at $22.50 to $23.50 per net ton, tidewater, the foundries are strongly disinclined to sell at anything like present prices for delivery next year.

**Old Material.**—The scrap market is exceedingly quiet. Even the foundries are only purchasing cast scrap in small quantities, merely providing for their daily wants and showing no disposition to purchase for forward delivery. Scrap buyers appear to be waiting for some indication of an improvement in pig iron or else an increase in orders for their own product. Little inquiry is being received here for steel scrap or rolling mill products. A cargo of 1840 tons of miscellaneous scrap from Panama was sold at $9.81, delivered f.o.b. cars Hoboken, N. J. Dealers' quotations per gross ton, New York and vicinity, are as follows:

| | |
|---|---|
| Rerolling rails | $12.50 to $13.00 |
| Old girder and T rails for melting | 11.50 to 12.00 |
| Heavy melting steel scrap | 11.50 to 12.00 |
| Relaying rails | 20.50 to 21.50 |
| Standard hammered iron car axles | 22.50 to 23.00 |
| Old steel car axles | 17.50 to 18.00 |
| No. 1 railroad wrought | 14.00 to 14.50 |
| Wrought iron track scrap | 12.50 to 13.00 |
| No. 1 yard wrought, long | 12.75 to 13.25 |
| No. 1 yard wrought, short | 11.75 to 12.25 |
| Light iron | 5.00 to 5.50 |
| Cast borings | 6.50 to 7.00 |
| Wrought turnings | 6.50 to 7.00 |
| Wrought pipe | 10.50 to 11.00 |
| Old car wheels | 12.00 to 12.50 |
| No. 1 heavy cast, broken up | 12.50 to 13.00 |
| Stove plate | 9.50 to 10.00 |
| Locomotive grate bars | 9.50 to 10.00 |
| Malleable cast | 12.00 to 12.50 |

## Metal Market

NEW YORK, October 19, 1910.

### THE WEEK'S PRICES

Cents Per Pound.

| | Copper. | | | Lead. | | Spelter. | |
|---|---|---|---|---|---|---|---|
| Oct. | Lake. | Electrolytic. | Tin. | New York. | St. Louis. | New York. | St. Louis. |
| 13 | 12.87½ | 12.75 | 37.50 | 4.40 | 4.27½ | 5.60 | 5.45 |
| 14 | 12.87½ | 12.75 | 36.90 | 4.40 | 4.27½ | 5.60 | 5.45 |
| 15 | 12.87½ | 12.75 | .... | 4.40 | 4.27½ | 5.60 | 5.45 |
| 17 | 12.87½ | 12.80 | 36.30 | 4.40 | 4.27½ | 5.60 | 5.45 |
| 18 | 12.87½ | 12.80 | 36.75 | 4.40 | 4.27½ | 5.60 | 5.45 |
| 19 | 12.87½ | 12.80 | 37.62½ | 4.40 | 4.27½ | 5.60 | 5.45 |

Following an advance of £2 15s. in tin in the London market this morning New York prices took a sharp upward turn, and with stocks especially scarce record prices may ensue. Copper is stronger and is selling well. There have been fairly good sales of lead of late. The spelter market continues quiet, but firm.

**Copper.**—The copper market is steadily but conservatively improving. Consumers are taking hold in a manner that indicates that either some of them have allowed their stocks to run very low or they have a great deal of confidence in the future of the market. The advance of ⅛c. per pound on both lake and electrolytic, which went into effect about nine days ago, is being well maintained, and it is highly probable that prices will go higher. It is certain that the market has a better tone than it has had at any time since the first of the year, and as sellers show no inclination to manipulate the market, but are willing to let it gain gradually in strength as the result of a healthy demand, it is fair to assume that the outlook is excellent. There has been a very good buying movement all the week. Some large sales of electrolytic were made at 12.87½c., delivered in the Naugatuck Valley, 30 days. The United Metals Selling Company is reported to have done most of the selling, and as this company has held its prices slightly under the rising market, it is not unlikely that they got most of the business. It is hard to state just how much has been sold during the week, as the big selling interests are reluctant about giving out information, but there have been inquiries out for fully 100,000,000 lb. Electrolytic copper is now firm, at 12.80c., and the price for spot copper in New York is 12.87½c. The market has such a strong upward tendency that an advance may be looked for at any time. Exports of copper so far this month have been good, amounting to 14,203 tons. In London to-day the copper market closed with spot copper selling at £57 and futures at £57 18s. 9d. The sales amounted to 900 tons of spot and 1700 tons of futures. The market was easy.

**Pig Tin.**—The decided scarcity of stocks of pig tin in this market, coupled with the excited condition of the London market, is keeping people interested in the tin trade in a highly nervous state. Following a sharp rise in the London market this morning, when quotations were advanced £2 15s., the New York market began to seesaw excitedly. During the early hours of trading all kinds of quotations were bandied back and forth, without any one getting down to business, and it took considerable time until the market settled to where a quotation of the actual price could be made. A good business was done in tin during the week until yesterday, when the bulls in London took a fresh hold and made it clear that they intended to send prices soaring again. Then consumers here who have been buying in small quantities seemed to get the idea that prices were going up to a prohibitive figure and promptly deserted the market. If they are able to hold out a few days there is relief for them in sight, as the steamer Minnewaska is due on Sunday with a record breaking cargo amounting to 1360 tons. This cargo will be unloaded Monday or Tuesday, and it will at least reduce the strain. The arrivals of tin so far this month have been 1769 tons, while there are 3127 tons afloat. The price of pig tin in New York to-day went to 37.62½c. The London market closed with spot tin selling at £169 and futures at £166. The sales amounted to 650 tons of spot and 1100 tons of futures. The market was strong.

**Tin Plates.**—The demand for tin plates has eased off slightly, and some can manufacturers who were making up stocks in anticipation of the heavy tomato crop in Maryland and Delaware have been informed that this crop is somewhat disappointing; and accordingly they are materially reducing their requisitions. The price continues unchanged with 100 lb. coke plates at $3.84.

**Lead.**—A fair demand for lead has developed and some sellers are under the impression that a good buying movement is in sight. Outside sellers of lead in New York have advanced their price five points and are now asking 4.45c. The American Smelting & Refining Company, however, continues to control the situation by offering it at 4.40c. The St. Louis market seems to be especially sensitive and offerings of 4.25c. are reported from there, but most sellers are holding the metal firm at 4.27½c.

**Spelter.**—The spelter market continues quiet but firm. Buyers are taking no interest in the market, but those who are holding stocks declare that production has fallen off materially and present quotation is a fair price. The metal can be had in New York at 5.60c., and at St. Louis the price is 5.45c. There are some reports of shading in the West, but as a rule the above prices are being well maintained.

**Antimony.**—The antimony market continues dull and uninteresting, there being only a small demand from the jobbing interests. Cookson's is 8.15c.; Hallett's has receded to 7.75c. Chinese brands can be had at 7.40c. to 7.50c., and Hungarian grades are being sold at as low as 7.12½c.

**Old Metals.**—The market is strong, but dealers' selling prices are unchanged, as follows:

| | Cents. |
|---|---|
| Copper, heavy cut and crucible | 12.25 to 12.50 |
| Copper, heavy and wire | 11.50 to 11.75 |
| Copper, light and bottoms | 10.75 to 11.00 |
| Brass, heavy | 8.00 to 8.25 |
| Brass, light | 6.75 to 7.00 |
| Heavy machine composition | 11.25 to 11.50 |
| Clean brass turnings | 7.75 to 8.00 |
| Composition turnings | 9.00 to 9.50 |
| Lead, heavy | 4.05 to 4.20 |
| Lead, tea | 3.80 to 3.95 |
| Zinc scrap | 4.15 to 4.25 |

**Metals, Chicago,** October 18.—There has been heavy buying of copper by a few large interests and some of the smelters are reported to have withdrawn quotations. The business done has been chiefly for November shipment, but a fair amount was for December and a few inquiries have been received for January. Tin has weakened slightly. Buyers are making low bids for spelter at East St. Louis, but without any response and it is understood that 5.40c., East St. Louis, is the lowest price actually done, equal to the quotation below for Chicago. Concessions are reported on soft lead, but the price quoted below is the lowest that is reported in this market on standard brands of desilverized lead. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.45c. to 5.50c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10⅝c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

**Metals, St. Louis,** October 17.—Lead is ruling quiet at 4.25c. to 4.30c.; spelter is steady at 5.40c. to 5.45c. both East St. Louis. Zinc ore is held at $42 to $43 per ton, Joblin base. Tin is quoted at 38c. per lb.; antimony (Cookson's) 8.50c.; lake copper, 13.25c.; electrolytic, 13.50c., all at St. Louis. The demand for finished metals was a little slower, but proved to be an average week's business.

# The Machinery Markets

The machinery markets in most industrial centers are gaining slowly in strength. The railroads seem to be taking a little more interest in machinery matters and inquiries from that source are more numerous. In the Farther Central West the railroad purchases are becoming a feature of the trade. The St. Louis & San Francisco Railroad has a small list out in the St. Louis market. In the East the railroad buying is chiefly in small lots for replacement. The trade in second-hand machinery is especially good, and in some sections, particularly in Chicago, a better business in that line could be done if salable stocks were easy to obtain. In Pittsburgh the machinery business is expanding and there is an excellent demand for heavy machinery. The market in Cleveland is dull at present, but a list of 200 tools is being compiled by the Lake Shore Railroad for new shops at Elkhart, Ind., and the trade is looking forward to some business from that source. Excellent reports come from Texas, where there is unusual activity in establishing new public service plants, such as power houses, water works, &c. In sections where trade is not so brisk machinery manufacturers are showing confidence in the future by making up machines for stock. The export trade, especially in mining equipment, continues good.

## New York

NEW YORK, October 19, 1910.

There are conflicting reports as to business in the general machinery trade and it is apparent that orders have not been evenly distributed during the last week. Representatives of at least two large New York machinery dealing establishments say that both inquiries and orders have fallen off and similar conditions are said to exist in the New York offices of a number of large machine tool manufacturers. On the other hand, some people are fairly busy. There is an excellent demand for automatic machinery and people who specialize in that line are behind in their orders. This is particularly true of manufacturers of screw machinery. There is also a good demand for forging machinery, such as bolt and nut making equipment, upsetting machines and the like. The railroads are buying in a desultory way. Two orders came into this market from the Baltimore & Ohio Railroad a few days ago and one house has inquiries for three machines from that source. The New York Central Railroad continues to place orders for single machines to be sent to its different repair shops and the Boston & Maine Railroad's purchasing department is feeling the market with a view to placing orders in the near future. The demand for second-hand machinery is active and good prices are being obtained for used machines. Most of the orders coming into the market for that class of equipment are placed by owners of small machine shops who do a general repair business. This would seem to indicate that many manufacturers are having their equipment repaired rather than investing in new machinery.

The Oneida Steel Pulley Company, Oneida, N. Y., which recently acquired the business of the Keystone Pulley Company, Pittsburgh, Pa., is making an extensive addition to its Oneida plant. At present the company has 100,000 sq. ft. of floor space and when the addition now in course of construction is completed the company will occupy 130,000 sq. ft. The company is adding materially to its manufacturing equipment.

The Stephens Mfg. Company, Rome, N. Y., has leased the second floor of a building on Main street, Rome, 60 x 100 ft. in size, and the company will purchase machinery for manufacturing the Diezemann carburetor. The list of machinery that will be required has not as yet been prepared.

The American Foundry & Machine Company, Brooklyn, N. Y., which is controlled by the American Tobacco Company, has been buying in this market during the last two weeks. The company chiefly manufactures tobacco working equipment.

The Max Ams Machine Company, Mt. Vernon, N. Y., has been a liberal customer in this market of late and has placed a number of good orders for machine tools.

The Niagara Machine & Tool Company, Buffalo, N. Y., will equip the forge, blacksmith and machine shop building at its new plant on the New York Central Railroad Belt Line at Northland avenue, with the Harrison Aertube system of heating and ventilating, and has awarded the contract to the Harrison Engineering Company, New York City.

George B. Woodmancy, Randolph, N. Y., will build and equip a power plant at East Randolph to supply electricity for lamps and motors in the village. The Public Service Commission, Second District, has granted permission.

The equipment of the power plant of the J. N. Adam Tuberculosis Hospital to be built by the city of Buffalo at Perrysburg, N. Y., will comprise three 80-hp. water tube boilers, feed pump, compression tank pump, vacuum pump, one 50-kw. and one 20-kw. generators, two 5-hp. motors and three 1-hp. motors. John H. Coxhead, 938 Ellicott square, Buffalo, is architect. C. A. Hager, Holland, N. Y., has general contract for the buildings.

The principal offices and factory of the Telephone Improvement Company, recently incorporated under the laws of the State of New York with a capital stock of $3,000,000, are to be located at Attica, N. Y., which is the home of Frederick C. Stevens, State Superintendent of Public Works, who is one of the directors of the new company and is to be its president. The new company is a consolidation of the North Electric Company of Cleveland, Ohio, and the Telechronometer Company of Rochester, N. Y., and will manufacture telephone message meters, time meters and switchboard improvements under patents which it controls. The other directors are Chas. H. North and James B. Hoge of the North Electric Company of Cleveland, Ohio; Morton E. Lewis and Garrison Babcock of the Telechronometer Company, Rochester, N. Y.; Alfred Stromberg, Chicago, Ill.; Edward E. Clement, Washington, D. C., and Winslow M. Mead, Deputy Superintendent of Public Works, Albany, N. Y.

The Browning Mfg. Company, Cleveland, Ohio, which is to erect a cantilever material handling bridge near Lockport, N. Y., has retained the Scofield Engineering Company of Philadelphia to design and supervise its construction.

The Commercial Register Company, Buffalo, N. Y., has been consolidated with the Benjamin Account System Company, recently incorporated at Rochester, N. Y., with a capital stock of $120,000, and a new manufacturing plant for the combined business will be built at Rochester. The new plant will be equipped with up-to-date woodworking machinery and motors for its electrical operation, Niagara Falls power being used.

The Syracuse Malleable Iron Works, Syracuse, N. Y., has let contracts for erection of foundry, annealing and trimming buildings on North Geddes street, to replace buildings destroyed by fire this summer. They will be of fireproof construction. The Syracuse Bridge Company has the contract for the steel work.

The McCain Construction Company, Mercer, Pa., has been awarded contract for construction of a bridge over the Mohawk River at Utica, N. Y., for the New York Central Railroad, at the west end of its Black River yards.

The Automatic Transportation Company, Buffalo, N. Y., will build an elevated railroad in Summit County, Colo., for transportation of ores from mines. The road will be built with single column Y top rail supports of steel and the ore cars will be operated automatically by electricity.

The Continental Can Company is having plans prepared for an addition to its Syracuse plant on Washington street, that city.

The F. H. Burt Company, Buffalo, manufacturer of paper boxes, which is building a five-story and basement addition to its plant at Myrtle and Hamburg streets, will require considerable box-making machinery for this addition, as well as for the six-story and basement addition to its Niagara street factory, now in course of erection.

## Chicago

CHICAGO, ILL., October 18, 1910.

Though unmarked by any individual transactions of unusual importance, last week's trade in machinery lines was of volume and character, indicating that the market is keeping step with general expansion. The leading machine tool houses, encouraged by a broadening demand, hold optimistic views as to the future. Orders are coming out in greater numbers from miscellaneous manufacturing interests, which,

# THE MACHINERY MARKETS

until within a few weeks ago, contributed very little to the general volume of business. Business with some houses is less active than others, but the difference is not so pronounced as it was, and all reports agree in representing decided improvement. A fair amount of business is being done in second-hand tools, but considerable difficulty is encountered in securing salable stocks of this kind.

It is understood that all of the tools in the large list of the Transcontinental Railway of Canada for its new shops at Winnipeg, pending since last spring, have been purchased during the last month. A large portion of the equipment was placed with Canadian manufacturers. One of the largest orders placed in this country was that given to Joseph T. Ryerson & Son, Chicago. The order embraced all of the punches and shears, flue shop machinery, steam hammers, hydraulic presses, hydraulic riveting machinery, pumps, accumulators and a large amount of miscellaneous machinery for the boiler and erecting departments. It is understood that the award amounted to about $75,000.

The Commercial Club of Peoria, Ill., is negotiating with a large veneer company which is seeking a suitable location for its plant. The company has a capital stock of $2,000,000 and employs about 350 men. The only bonus sought by the company is a site of 20 acres, in consideration of which it agrees to erect a building 200 x 600 ft., three stories.

The Mattoon Machine & Foundry Company, Mattoon, Ill., has been incorporated with $25,000 capital stock to engage in a general foundry and machine business and specialize in the manufacture of a steam valve recently invented by Charles N. Goon and John Cantlon, Sr., two of the principal incorporators. A site for a plant has been secured adjacent to the Illinois Central Railroad, and building operations will be commenced in a short time.

The Western Electric Company, Chicago, at a special meeting recently held by its directors, authorized the expenditure of $900,000 for extensions and improvements of its Hawthorne plant. The improvements to be made will consist of a new switchboard building and other buildings and improvements about the property.

The National Machine Recorder Company, Marquette Building, Chicago, has greatly increased its manufacturing facilities by the installation of new equipment. The company has leased the entire first floor of the manufacturing building located at 213 Englewood avenue. The company also holds an option on the other four floors of the building, and will in the course of about 90 days occupy two additional floors, at which time considerable new equipment will be purchased.

Bids will be received until October 22 by the city of St. Charles, Ill., for boilers for installation in the electric light plant.

In connection with new additions to its plant, the Kewanee Boiler Company, Kewanee, Ill., is installing four electric traveling Northern cranes, manufactured by the Northern Engineering Works, Detroit. These cranes are of alternating current Northern type E design, ranging in capacity from 5 to 15 tons and 55-ft. span.

The Olson Rug Company, Chicago, has awarded contracts for the construction of a new factory building, 75 x 125 ft., five stories and basement. The building will be equipped with elevators, heating plant and automatic sprinklers, and will be constructed at a cost of about $60,000.

D. S. Pentecost, 79 Dearborn street, Chicago, has completed plans for a one-story blacksmith shop, 25 x 80 ft., to be erected at Armitage avenue and Ballou street, for John O'Neill. The building will be of brick construction with cement floors.

The Stromberg-Carlson Telephone Mfg. Company, Chicago, Ill., and Rochester, N. Y., has purchased the American Telephone Company's entire common battery business, together with all its inventions, patents, patent rights, patent applications, all tools, patterns, drawings, records and everything relating to or used in the manufacture or sale of above mentioned batteries.

I. & S. Lanski, Chicago, are having plans prepared for a four-story factory building, 127 x 165 ft., to be erected at the southwest corner of Morgan and Twenty-first streets. It will be of reinforced concrete, standard brick and mill construction, and will be equipped with automatic sprinkler system, steam heating and electric freight elevators.

The trustees of the Central Mfg. District, Chicago, are about to erect for the J. L. Metz Furniture Company a new factory building, 80 x 160 ft., six stories and basement. The building will be of heavy mill construction and will be equipped with two large electric freight elevators, automatic sprinkler system and a heating plant.

The La Crosse Hay Tool Company, Chicago Heights, Ill., has increased its capital stock from $100,000 to $200,000.

The Moline Pump Company has definitely decided to locate its new plant in Ottumwa, Ill. It will be erected at a cost of $45,000 and will include a two-story warehouse and office building, 80 x 150 ft.; a foundry, 80 x 120 ft.; machine shop, 100 x 200 ft.; engine room, 40 x 60 ft., and a paint shop, 60 x 80 ft.

The D. M. Sechler Carriage Company, Moline, Ill., has decided to change its name, and it will hereafter be known as the D. M. Sechler Implement & Carriage Company. The company is preparing to make extensive repairs and improvements with a view to enlarging the capacity of its plant.

## Philadelphia

PHILADELPHIA, PA., October 18, 1910.

Manufacturers in some instances report a slightly better volume of business during the first half of the month, as compared to the same period in September; the demand, however, is still irregular and business is confined to small orders. A good share of the business taken has come from buyers located outside the immediate territory. Few merchants report any betterment in trade conditions. For some few classes of tools there has been a fair amount of inquiry, but prospective buyers postpone purchases as long as possible. From the upper portion of the State, covered by merchants in this territory and usually productive of a fair amount of business, extreme quietness is reported. There has been little in the way of new business from automobile manufacturers and even the recent light demand which has been coming from the railroads in this territory has been less active.

For what little business there is offered competition is sharp and in some instances price cutting is reported. The trade notes, however, that cancellations on orders in hand have recently been less pronounced. A few orders for special equipment for export are reported, but the demand for tools of the standard types is unimportant. Very little change is to be noted in connection with either steel or gray iron foundries. New business comes out slowly and in some instances prices have a tendency to be easy. This is particularly noticeable for some classes of steel castings.

Machine tool builders operate plants on about an even basis, but the lack of fresh orders will, no doubt, have some influence on the situation in some directions. It is to be noted, however, that builders of textile machinery are for the most part pretty well engaged.

The demand for boilers and engines shows no material betterment, although some pretty fair propositions are still under negotiation. That for second-hand power equipment is also dull, while but a moderate demand of a day to day character is reported for second-hand machine tools.

The contract for the addition to the manufacturing plant of the McCaffrey File Company has been awarded to the Charles McCaul Company. A portion of the addition will be used as an extension to its forging department.

Robert C. Gray, formerly secretary and treasurer of the Hartman Company, engineers and machinists, succeeds the late John M. Hartman as president of that company. W. H. Farrell, who was Mr. Gray's assistant, succeeds him as secretary-treasurer. This company finds general business rather irregular of late, although some few departments, particularly that connected with wrought iron pipe work, keep actively engaged.

The Espen-Lucas Machine Works reports the demand so far this month better than that during the same period in September, and orders taken have been more numerous. There has been some scattered business for export, and shipments of foundry cold saws and boring mills have been made to Canada and England. The plant continues fairly busy on a general line of cold saw cutting off machines, boring mills and slab milling machines.

The Zephyr Ventilator Mfg. Company is fairly busy and the coming season promises to be quite active. This concern is developing a new style of its Zephyr ventilator in order to meet the wider scope of ventilation demanded in some districts. This new type will have 42 sq. in. of aperture per running foot and is proportionately larger than the standard type.

The Earle Gear & Machine Company is operating its plant at full capacity. A large amount of cut gear work is on hand, a number in nickel steel for the American Steel & Wire Company running up to 140 in. in diameter. A number of Lea Simplex cold saw cutting off machines are being built for the Lea Engineering Company of New York, as are also quite a number of Lea high duty fire pumps. Several tag making machines as well as other special tools are included among the orders recently received.

The Tacony, Frankford & Holmesburg Traction Company, Tacony, Philadelphia, is taking bids for a brick and steel addition to its boiler house at State Road and Robins street.

The Knaut Machine Company, Reading, Pa., which for

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a number of years has been located at 316 Maple street, in that city, has removed to new and larger quarters at 221 South Ninth street. This company makes a specialty of hat making machinery as well as a general line of special machine work.

The Keystone Steel Casting Company, Chester, Pa., which recently made extensive improvements to its plant, contemplates still further extensions in the near future, the details of which are not yet ready for announcement. This concern, which makes a specialty of vanadium, tungsten, manganese, nickel or any alloy crucible steel, is now under the management of R. B. Farquhar, Jr., formerly connected with the Taylor Iron & Steel Company, High Bridge, N. J.

Plans have been prepared for a 12-story building by Joseph E. Sperry, architect, to be erected by the Baltimore Bargain House, Baltimore, Md., at Baltimore, Garrett and Liberty streets. Henry Adams, engineer, will look after the engineering features of the building. Detailed information is not yet available, but it is understood that it is proposed to begin work on the new building early next year.

Announcement has been made in Baltimore, Md., that the contract for the new bottling department for the Monumental Brewing Company, Highlandtown, Baltimore, Md., has been awarded to the Engineering & Contracting Company of that city.

Plans are being prepared by J. E. Laferty, architect, Baltimore, Md., for a large manufacturing building of steel frame and corrugated iron, to be erected for the Baltimore Siegwart Company, which, it is stated, is to be equipped with modern machinery for the manufacture of cement products. The new plant will be built at Curtis Bay, near Baltimore, Md.

## Cleveland

CLEVELAND, OHIO, October 18, 1910.

The machine tool market continues dull. Dealers report no change in the volume of orders, but some have been getting more inquiries during the past week. While none of these are large, some are for from four to six tools, being larger than most of the inquiries that have recently come out. Orders are coming from scattered sources and no kind of tools is in particular demand. Machine tool builders generally report the demand light. Some have got pretty well caught up on old orders and have commenced to make tools for stock. A hopeful feeling prevails and builders look for a better demand before they have accumulated many stock machines. Very little business is coming from the automobile trade and only a few single tool orders from the railroads. The demand for second-hand tools is fairly active, coming largely from the smaller shops. Dealers also report the supply business fairly good.

Orders for electrical equipment are rather light, but an improvement in the outlook is noticed. The demand is largely for small equipment. Boiler shops are well filled with orders, but the demand at present is somewhat light.

In the foundry trade conditions are about stationary. While there is not a large amount of new work coming out jobbing foundries are quite busy.

The Lake Shore Railroad list of machine tool equipment for its new shops in Elkhart, Ind., is about completed, and it is expected that it will be out shortly. It is announced that the list will include about 200 tools, practically all for the locomotive shop equipment. Delivery of the machinery will not be wanted before next spring. Orders have been placed for the equipment for the large power plant to be erected in connection with the new shops.

At the time the successful Industrial Exposition was held in Cleveland in the summer of 1909 the need of a permanent exposition hall was impressed on some of the leading business men and the matter, which has been under consideration and investigation since that time, has now taken definite shape. At a meeting of prominent business men at the Chamber of Commerce a few days ago it was decided to go ahead with the project at once, and President George W. Kinney has named a commission of 250 citizens which will take in hand the matter of financing and building the new structure. It is planned to erect a large building containing an auditorium seating 2500 people and an exposition hall capable of housing 10,000. The project will involve an expenditure of about $500,000. F. F. Prentiss, former president of the Chamber of Commerce, is at the head of the movement.

The Bishop & Babcock Company, Cleveland, will make further extensions to its plant. A one-story brick building, 50 x 100 ft., for its model making department, is under way, and plans are being prepared for a large addition to its brass department. This will be a brick building, 50 x 150 ft., four stories and basement. This will include a brass foundry. The company will shortly be in the market for considerable brass working machinery. The equipment for the model department has been purchased. Both buildings will be equipped with sprinkler systems. This company will also rebuild and enlarge its Indianapolis plant, which was badly damaged by fire a few weeks ago. This plant will be 70 x 300 ft., and two stories. As the section of the plant containing the machinery was not seriously damaged by the fire, not much in the way of additional machinery equipment will be required. The Bishop & Babcock Company recently completed other additions to its Cleveland plant that added 2 acres to the floor space in the department devoted to the manufacture of soda fountain equipment.

The Globe Machine & Stamping Company, Cleveland, which recently decided to build a new plant, has acquired a site on West Seventy-sixth street, adjoining the plant of the Standard Welding Company. The site comprises 40,000 sq. ft. The company will at once begin the erection of a portion of its new plant to provide a floor space of 16,000 sq. ft., to be used in the manufacture of tool and battery boxes. The main building, which will contain about 30,000 sq. ft. of floor space, will be built later. This will be used for the stamping, tumbling barrel and special machinery departments. The first section will be ready for occupancy about March 1, and it is the intention to have the entire plant completed in 18 months. It will greatly increase the company's present capacity.

The Marion Shovel & Dredge Company, Marion, Ohio, has broken ground for its new plant, which it is expected will be ready for operation in February. At present four shop buildings will be erected. These will include a machine shop and erecting room, 120 x 210 ft.; a blacksmith and structural shop, 60 x 210 ft.; a carpenter shop, 60 x 112 ft., and a power house, 60 x 100 ft. The plant will have a capacity of 10 shovels per month. A. E. Cheney is general manager and secretary of the company.

The Cleveland Wire Spring Company, Cleveland, which is building an addition to its plant, will use the additional space, amounting to 30,000 sq. ft., for increasing the capacity of its metal goods department. This includes steel barrels, shop boxes, tool racks, steel shelving and other shop furniture.

The Dover Boiler & Construction Company, Canal Dover, Ohio, has been organized by S. W. Dickerson and P. A. Arnold to take over and operate the plant of the Acme Boiler & Construction Company, which recently went into the hands of a receiver. Improvements will be made to the plant.

A contract has been practically closed for the removal of the plant of the Bunting Brass & Bronze Company from Alliance to Toledo, Ohio. The plans provide for the erection of a new plant and the removal of the machinery now in the Alliance plant.

The plant of the Smith Tractor Mfg. Company is being removed from Chicago to Wapakoneta, Ohio, where it will become a part of the plant of the Ohio Steel Wagon Company. A gasoline farm tractor will be manufactured. It is expected that the additional product will in a short time necessitate the enlargement of the present plant.

The Kilby Mfg. Company, Cleveland, reports that it has enough work on hand to keep its plant running full for some time. The company had a good volume of orders for sugar making machinery on its books during the past few months and has recently taken some good orders in other lines.

The West Lock Company has moved from Columbus to a new plant which it has built in London, Ohio. Its new quarters give the company greatly increased facilities for manufacturing its products.

The Peerless Machine & Stamping Company, Cleveland, has been incorporated with a capital stock of $10,000 by William A. Steinbrenner and others.

The Atlas Engineering Company, Cleveland, recently incorporated with a capital stock of $15,000, has bought out the equipment of the Superior Tool & Mfg. Company and has established a plant at Superior avenue and Thirty-first street for repair work. William Bachman is president of the company and J. P. Nystrom manager.

The Zoar Fire Clay Company, in which E. F. Houser and others are interested, is being organized in New Philadelphia, Ohio, to build a brick and sewer pipe plant in Zoar, Ohio.

The Dunham Nutlock & Bolt Company is looking for a site for a plant to manufacture a self-locking nut and bolt, the invention of Samuel Dunham of Steubenville, Ohio. The Akron Chamber of Commerce is making efforts to secure the concern for that city.

It is announced from Toledo, Ohio, that the Dusseau Fore & Rear Drive Auto Company, recently incorporated in that city with a capital stock of $100,000, is planning to build a factory for the manufacture of automobiles and auto trucks.

During the fiscal year ending June 30, 1910, the American Shipbuilding Company built 23 lake boats, having a carrying capacity of 158,500 net tons, and now has 12

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vessels under contract. The company expects to have its new plant at Port Arthur in operation by January 1. This includes a 700-ft. dry dock, steel punch shop building, machine shop, building berth and equipment. At Buffalo the company has completed a 700-ft. dry dock, boiler house and office building. The new forge shop at Lorain, Ohio, capable of making the heaviest forgings that are used in vessel construction, will be in operation by November 1.

The steamer William P. Palmer, named in honor of the president of the American Steel & Wire Company, was launched at the Ecorse plant of the Great Lakes Engineering Works October 15. The Palmer is the last of the three 600-ft. 12,000-ton freighters built at the Ecorse yards this year for the Pittsburgh Steamship Company. This boat will not be placed in commission until next spring.

The McCaskey Register Company, Canton, Ohio, has increased its capital stock from $500,000 to $1,000,000, for the purpose of taking care of the large expansion in its business and providing for additional buildings which are now being constructed.

## Cincinnati

CINCINNATI, OHIO, October 18, 1910.

A market report from this section of the country would necessarily have to refer to politics if local conditions are to be followed closely. While not much interest is taken by business men generally in the result of the coming November election, everyone earnestly wishes that it was over with. Business is quiet in many lines and the machine tool trade has been affected to some extent by the unsettled conditions for which there is no tangible reason except political agitation. Close observers, however, predict that the country will commence to experience a period of commercial activity soon after November 8. Weather conditions have been perfect for pushing work on new plants and additions in this territory, and several new factories in the course of construction here will be finished ahead of the scheduled time.

Orders for machine tools continue coming in slowly, but some tool builders appear to be drawing a full share of business. It was rumored last week that one of the larger railroad systems had bought heavily on a list issued some time ago, but investigation proved that only a few emergency tools were purchased.

The December meeting of the Cincinnati Metal Trades Association will be held at the Business Men's Club December 8. This will be the final meeting of the year, and will not only be largely attended by Cincinnati manufacturers but by a great many from other cities. This will be in the nature of a railroad session, and it is planned to have the executive heads of the more important trunk line railroads for speakers. The association feels that the present agitation against the man who has a dollar invested in almost any kind of business industry justifies closer relations between the manufacturer, shipper and the railroads, and it is hoped that the December meeting will materially aid in bringing about this result.

South American trade with Cincinnati manufacturers seems to be on the increase. The Dreses Machine Tool Company made a recent shipment of several radial drills to Buenos Aires, Argentina, and the American Laundry Machinery Company has just received an order for a large laundry outfit from the same point.

Boilers aggregating 1000 hp. will be installed in the Henry street plant of the Christian Moerlein Brewing Company, Cincinnati. B. Baldwin & Co. are drawing the plans for the new addition.

K. Kishi, a mechanical engineer and manager of Andrews & George, machinery importers of Osaka, Japan, is in Cincinnati for the purpose of conferring with several machine tool builders represented by his firm in Japan. The shops visited by him include that of the Lodge & Shipley Machine Tool Company, Cincinnati Shaper Company, Cincinnati Planer Company, Cincinnati Milling Machine Company and the Cincinnati-Bickford Tool Company. It is expected that Mr. Kishi's visit will result in an increased machine tool business with Japan.

The Portable Safety Gate Company is a new Cincinnati incorporation with $10,000 capital stock, to manufacture a residence door device. The incorporators are G. E. Conners, John H. McMakin, C. W. De Armond, T. N. Eller, and Chas. T. Fennel. Temporary offices are at 1009 Mercantile Library Building.

The Grimm Architectural Iron Works Company, Cincinnati, is having plans prepared for a manufacturing plant to be erected on Spring Grove avenue.

The Dick Mfg. Company, Canton, Ohio, has had plans prepared for a new building that will nearly double its output of agricultural implements.

Plans for enlarging the water works at West Carrollton, Ohio, are being prepared by E. F. Layman, civil engineer. A new pumping station and concrete reservoir will be installed.

The new plant of the Victor Safe & Lock Company, in Norwood suburb, is nearly completed and the company expects to move in at an early date. An additional building lot adjoining the site of the new plant has been purchased and it is understood other buildings will be erected some time next year.

A three-story factory building, 168 x 230 ft., will be erected by the Bode Realty Company at 1648-50 Central avenue, Cincinnati, to take the place of a manufacturing structure on the same site that was recently destroyed by fire. The Warner Pole & Top Company, a local manufacturing firm, will occupy the top story.

The Chesapeake & Ohio Railroad Company is rushing work on its new shops near Melbourne, Ky., and the opening of the spring season will probably see them far enough finished to install some of the necessary tools and equipment.

It is reported that the Baltimore & Ohio Railroad Company will soon commence work on a car repair shop at Keyser, W. Va. The main building will be of steel and concrete construction, 50 x 300 ft.

The free public night Continuation School for foremen held its first session Friday night, October 14, at its quarters on Ninth street, Cincinnati. About 50 shop foremen were present, and indications are that the proposition will be a big success during the fall and winter season. Two meetings a week are held and the course mapped out includes a general discussion of shop methods, machines, &c.

The Champion Safety Lock Company, Geneva, Ohio, has increased its capital stock from $75,000 to $100,000. It is understood the company intends to make some additions to its plant.

The Heer Engine Company, Portsmouth, Ohio, has increased its capital stock from $50,000 to $125,000, and advises that $25,000 of this amount will be used for the erection of a new building and the remainder for working capital.

The Fostoria Aluminum Mfg. Company, Fostoria, Ohio, is considering the erection at Mishawaka, Ind., of a concrete foundry building, 65 x 95 ft., and a fire and waterproof office and pattern storage building, 22 x 24 ft. The equipment for the foundry will include oil furnaces for melting brass and aluminum, band saws, molding machines, &c., all of which will be electrically operated.

## Pittsburgh

PITTSBURGH, PA., October 18, 1910.

The market for machinery is slowly but steadily gaining in strength and volume. The most gratifying feature of the situation is the fact that the ground won from week to week is held and that the demand shows considerably greater diversity than earlier in the fall.

The railroads continue to delay purchasing on the lists prepared by their equipment departments, but increasing compensation is found in the buying that is being done for manufacturing plants in general, not only here but elsewhere through the country. Any close canvass of inquiries now before the trade would undoubtedly reveal a large aggregate of prospective business, and many of these are such as to indicate that contracts will be closed in the near future.

In the line of equipment for handling heavy material there appears to be a great deal of activity. Crane builders are particularly busy, and manufacturers or agencies concerned in the sale of hoists, steam shovels, dredges, sand pumps and other machinery for excavating or filling, ore, rock and coal handling, &c., have been called upon lately to do much estimating, either for immediate delivery to Southern points and abroad or for next season's requirements of contractors, transportation companies, mining operators and others whose present open season in Northern districts is nearing its close. Preparations of the character last named are being much more generally made than is credited by most observers.

Of all lines of machinery building, however, the manufacture of electrical apparatus easily leads in its present activity. Significant of this is the fact that advertisements for armature winders, testers, installation experts and other men skilled in generator, motor or transformer work, &c., are constantly appearing in the newspapers of the district. Despite all of the drawbacks affecting industrial conditions as a whole, the great shops of East Pittsburgh and Wilmerding are experiencing one of the most prosperous seasons in their history; and, while fall business started is

# THE MACHINERY MARKETS

a bit slower than anticipated by the trade, every indication points to the fact that it will close strong.

Much interest has been aroused here by the announcement that the contract for the electrification of the Hoosac Tunnel on the line of the Boston & Maine Railway from Rotterdam Junction to Boston, Mass., involving the expenditure of over $1,000,000, has been awarded the Westinghouse Electric & Mfg. Company, Pittsburgh, being the most important work of the kind to be undertaken this year. A power plant equipped with three generating units aggregating 12,000 kw. in capacity will be built near one end of the tunnel, and the initial order also calls for five electric locomotives of the type designed for the Pennsylvania Railroad, together with the equipment necessary to their use. These will be driven by single phase alternating current motors such as have been put in successful service on a number of heavy traction lines.

The Board of Trade at Buckhannon, W. Va., is reported to have made arrangements there for the construction of a glass factory to be operated by a concern whose name has not yet been made public.

The damage recently caused by fire to the plant of the Raymond Mfg. Company, Corry, Pa., will be repaired as soon as possible, and some remodeling and extension of the company's manufacturing facilities is likely to result.

The Tidewater Portland Cement Company, Union Bridge, Md., has placed an order with the Wisconsin Engine Company, Corliss, Wis., for three horizontal cross compound engines, with cylinders 23 and 43 in. by 48-in. stroke, to be operated condensing; speed, 100 rev. per min. Each will be direct connected to a three-phase 60-cycle alternating current generator of 925 k.v.a.

A rotary converter of 1000 kw. is now being installed by the Westinghouse Electric & Mfg. Company in the main power plant of the Little Rock Railway & Electric Company at Little Rock, Ark.

A gas engine driven pumping unit is included in the plans for a new water works station to supply Wheeling Heights, which J. R. Kommer of Pittsburgh has prepared for the city of Wheeling, W. Va. An 80-ft. steel standpipe will also be needed in carrying out the system proposed.

In order to inaugurate the campaign for new industries recently planned, the McKeesport Chamber of Commerce, McKeesport, Pa., has offered a tract of 20 acres to be used for the sites of plants intending to locate there.

The Columbus Motor Car Transportation Company is reported to have been incorporated at Columbus, Ohio, for $100,000.

Ludwig Hommel & Co., whose offices here are in the Lewis Block, represent the Garwood Electric Company, Garwood, N. J., in the sale of that company's motors, which have established an excellent record at various installations in the district for high efficiency and reliability under severe continuous service.

The Fairmont Mining Machine Company, Fairmont, W. Va., is letting contracts which will more than double the present capacity of its shop facilities. A new office building is also to be erected.

The plant of the Barndt & Johnston Auto Supply Company, Columbus, Ohio, is very active at the present time. Additions to the shop force, including body makers, are now being made.

The trade of the Kinnear & Gager Mfg. Company, Columbus, Ohio, in metal ceilings now extends throughout the country, as far as the Pacific coast, where local representatives are maintained. Special features of design, such as an interlocking slip joint and quadruple lock joint, have been largely responsible for the widespread sales. Other products of the company are also in good demand.

Contracts will be placed this month by the Seng Creek Coal Company, Jarrolds Valley, W. Va., for machinery with which to operate its mining equipment and handling plant electrically.

The Pittsburgh office of the United States Cast Iron Pipe & Foundry Company has taken a large contract at Erie, Pa., for material to be used in the extension of the waterworks system to supply the new Wesleyville water and coaling yards of the Lake Shore Railway.

The Pittsburgh Metal Products Company has been incorporated by A. J. Barron, J. A. Beck and Albert K. Little, Pittsburgh, with the stated purpose of manufacturing iron and other metal products and carrying on experiments and research with metals.

The Russell Engine Works, Massillon, Ohio, has been awarded the contract for two new boilers and an engine-driven electric unit of 175 kw. for the new municipal power plant at Carlyle, Ill.

The plant of the Davis-Price Foundry & Machine Company at New Cumberland, W. Va., destroyed by fire recently, will be rebuilt on the old site. Plans are now being made which will be completed within a short time. It is the intention of the company to do this work with its own organization and bids from outside concerns will not be asked.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has awarded contracts for a new erecting shop, 60 x 150 ft., with a crane runway. The company has considerable business on its books and is now working on large contracts for steel castings for the Panama Canal lock gates and the new mills of the American Sheet & Tin Plate Company, Gary, Ind.

The Erie City Iron Works, Erie, Pa., manufacturer of steam engines, boilers and feed water heaters, has been awarded a contract for a pumping station for the Eldred Drainage district, Hardin, Ill. The pumps will have a capacity of 150,000 gal. of water per minute.

The Treadwell Construction Company, Midland, Pa., builders of heavy steel plate and construction work, has recently received orders as follows: One 60-ft. stand pipe, 25 ft. in diameter, for the Superior Steel Company, Carnegie, Pa.; some 90-in. gas mains for No. 1 electric power station at the plant of the Indiana Steel Company, Gary, Ind.; all pipe for the Sharpsville Furnace Company, Sharpsville, Pa., Arthur G. McKee, of Cleveland, being engineer for this work, and a large tank for the Gulf Refining Company for its plant at Bayonne, N. J. The company states that its shops are well filled up and it has about three months' work on hand.

## New England

BOSTON, MASS., October 18, 1910.

The supply and tool steel people are receiving numerous but small orders. Their business is improving somewhat, though not equaling that of earlier in the year. The machinery dealers are not busy. The week has been a fairly good one, everything considered, but, as with other lines, it depended on the number rather than the size of the orders. The market for woodworking machinery is not what it should be at this season. Because of the dullness of the lumber business, said to be due to overproduction, the demand for the heavy machinery required by the industry is small, and the market for heavy circular saws is proportionately off. The Boston & Maine Railroad is placing some orders in connection with the equipment of the Hoosac Tunnel at Zylonite, Mass. The company's immediate improvements, amounting to $2,500,000 in addition to the Hoosac Tunnel electrification, are naturally of particular interest to the Boston dealers, because under their territorial rights, they will be credited with all sales of the tools which they represent. The purchasing department of the Boston & Maine is now merged in that of the New York, New Haven & Hartford at the South Station, Boston. The effect of this move is being watched keenly by the trade.

The railroads are now generally blamed for a large share of existing business conditions. Their curtailment of purchases has become extraordinary, according to reports received from the traveling salesmen who represent local houses. The common experience is voiced by that of a large dealer in tool steel, having men on the road, who pay special attention to the railroads and other large buyers. In soliciting business in the railroad repair shops a common statement by superintendents is that they have already specified this steel in requisitions. The purchasing agent admits the fact, and explains that the matter has passed him and is in the general manager's office. It has been held up, in common with everything else, excepting where the requisition is for something imperatively needed. The current belief is that buying has been deferred by the railroads until after the Interstate Commerce Commission had settled the freight rate question. According to the dispatches this whole matter will be deferred to February, and it is not believed possible that the condition of rolling stock will permit of any such protracted delay in buying. In New England railroad purchases should be large, but largely confined to the Boston & Maine system.

The Baird Machine Company, Oakville, Conn., manufacturer of special machinery, presses, tumbling barrels and dies, has acquired a tract of land in the vicinity of Bridgeport, Conn., and has engineers at work developing and laying out an entirely new and completely modern plant for the production of its line of machinery. The decision as to location of the works has been reached only after long and careful investigation. Only five years ago a building 40 x 100 ft., and two stories was added, and two years later another structure of similar size was erected. No space remaining immediately adjacent to the buildings, it was first decided to build a large shop to replace the original structure, but this would have been the last unit of contiguous growth unless adjacent land could be acquired, which proved to be impossible. Further progress on expansion was then held up, and a piece of land at Thomaston, Conn., was

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acquired. The fact leaked out, and, being published, resulted in boards of trade, chambers of commerce and other bodies from very many cities, coming forward with offers of inducements to move to their cities. Locations outside of the Naugatuck Valley were not considered, but a number of places in the Valley were investigated, resulting in many wild rumors. The company desired as many as possible of such facilities as trolley and steam railroad sidings, city water, gas, location on a main railroad, and land enough for future expansion and the addition of a foundry. It was not the desire of the officers to leave the vicinity of Waterbury, and time and money were lost in waiting for the development of various propositions in and around the city. A few days ago, after a very earnest effort on the part of the Bridgeport Board of Trade, a piece of land was acquired fulfilling the necessary conditions. The Baird Machine Company was established in 1891, by J. H. Baird, Fred E. Warner and R. T. Lewis, Jr., the last named gentleman dropping out a few months later and Mr. Warner followed him in 1895. In 1901, C. L. Warner entered the business as secretary, treasurer and general manager, Mr. Baird continuing as president. A business employing 15 men in 1905 has grown to 150 at the present time. Persistent increase demands the radical step of moving the industry to a new location where much greater facilities will be available.

The Automatic Machine Company, Bridgeport, Conn., manufacturer of automatic threading lathes, scroll threading lathes, Coulter horizontal nut tapper, wire crimping and wire forming machines and presses, has increased its authorized capital stock from $300,000 to $500,000, $120,000 of the new securities having been issued. The new money is needed because of the rapid growth of the business. The company's sales for the first nine months of this year were over 70 per cent. ahead of 1909, and even with this production a considerable amount of business was lost because of the inability to fill orders. The money will be used for working capital and for new equipment, practically all of which has been contracted for.

The business of the L. L. Hull Company, Clinton, Conn., manufacturer of hardware specialties, has been incorporated with a Connecticut charter. The incorporators are Sturgis G. Redfield, Mary Hill Redfield, M. C. G. Witte and Adella L. Witte. The business was established in 1870. The incorporation means no change in product or management.

The Massachusetts Fan Company, Watertown, Mass., has been awarded the contract for the induced draft apparatus for the Zylonite, Mass., plant of the Boston & Maine Railroad, which will furnish power for the Hoosac Tunnel after its electrification has been completed. The set will be a duplicate of that recently installed for the Housatonic Power Company at Waterbury, Conn. It consists of a battery of two fans, operating either together or independently, with a combined capacity of 234,000 cu. ft. of air per minute at a pressure of 1 in. water column. The wheels are 12 ft. 6 in. in diameter, with floats 5 ft. 5½ in. at the periphery. They are direct connected to the engine, with an intermediate water cooled bearing.

The Universal Boring Machine Company, Hudson, Mass., manufacturer of boring machines, is pushing work on the addition which will double its capacity. The building will be of a temporary nature. The foundations are for a four-story structure, and this will be completed later. The present purpose is to secure additional manufacturing space at the earliest possible moment, for existing facilities will not permit of keeping up with orders.

Henry D. Lloyd has been made manager of the Massachusetts Fan Company, Watertown, Mass., manufacturer of blower and exhaust systems.

New England manufacturers and other shippers are a good deal exercised over the new demurrage rules established by the several great railroad systems of the section. Local statutes in the several States fix a 96-hour limit. But the regulations of the Interstate Commerce Commission make it 48 hours, but with important modifications which in reality serve to extend the average limit well beyond the 48 hours. The 7 a. m. clause reckons the 48 hours as beginning at the first 7 a. m. after placing the shipment on the public delivery tracks, after forwarding the notice of arrival to the consignee. While under local laws no cancellation of demurrage could result from climatic conditions, under the new rule demurrage charges will not be assessed when it is impossible to move freight to or from cars without serious injury to it, or when shipments are frozen, to interfere with removal, or where there are floods or snowdrifts. However, local organizations are protesting vigorously to the Interstate Commerce Commission, against the application of the general rule to New England.

The machine tool builders are watching conditions abroad with the expectation that foreign orders will soon show an important increase. In fact the improvement is already noticeable, so much so that very much more than ordinary effort is being directed with the purpose of getting this business. Those connected with the machinery trade who have been in Europe this summer express a good deal of confidence in the immediate future of business there, in its relation to the machinery builders of America.

W. A. Peck, formerly with the Kilborn & Bishop Company, New Haven, Conn., and the Bullock Mfg. Associates, Springfield, Mass., has begun the manufacture of a line of tools and hardware specialties at 141-145 Brewery street, New Haven.

## Detroit

DETROIT, October 18, 1910.

There is now enough business in sight to practically insure a steady run of buying from manufacturers and dealers in this territory for standard lines of equipment of all kinds. The activity in the preparation or completion of plans for new factories, shop and foundry additions, &c., continues unabated, and in the lines most closely related to the metal trades the closing months of the year will undoubtedly witness a degree of expansion approaching, if not equaling, that of last autumn when conditions were wholly unprecedented. The full effect of this, so far as the market for machine tools is concerned, will probably not be felt until some time later; but in the plants producing such equipment there can hardly fail to be enough work on hand, meanwhile, to keep them running steadily. Fabricators in structural iron and steel, in both standard and special shapes, and manufacturers of ornamental metal fittings are all busy; and, while few large contracts have been figured on recently, considerable work is still to come out before cold weather sets in.

The Bennett Axle & Transmission Company has been organized in Detroit by Frank E. Humphrey and Charles Gleason, with a capital stock of $150,000. Concerning the company's plans, no authoritative statement has as yet been made.

The Day Automobile Company was recently incorporated with $200,000 capital stock, to establish a plant in Detroit for the manufacture of an automobile convertible into a road wagon or delivery cart. An output of 1000 machines has been decided upon for next season. The president is Thos. W. Day; vice-president, Hugh Jennings; secretary, Cameron F. Roberts; treasurer, Wallace E. Brown.

The Rose Chemical Company has been organized at Rose City, Mich., and will operate a factory in that vicinity.

An increase has been made in the capital of the Clark Power Wagon Company, Lansing, Mich., and preparations for a heavy season's output are under way.

The Pingree Company, Detroit, recently ordered plans drawn for a six-story factory building, 60 x 100 ft.

The Pontiac Power Company, Pontiac, Mich., will issue bonds to the amount of $114,000 to provide funds for contemplated construction work.

The Calumet & Hecla Mining Company has just completed patterns and will cast in its own foundry at Lake Linden, Mich., the frame of what, it is said, will be the largest ore crusher in the world. This one part will weigh 20 tons.

It is reported from Saginaw, Mich., although without definite information, that the Whipple Electric Company has been organized there to build a power and lighting plant.

Work is now under way on the large new power plant for the Cleveland-Cliffs Iron Company at Negaunee, Mich.

Two boilers, of 150-hp. each, will be among the requirements of the Ohio Dairy Company in consequence of an addition to be made to its plant at Morenci, Mich.

The Volunteer Ore Company, Duluth, Minn., in which Thomas F. Cole and G. A. Tomlinson are interested, is opening up a large mine at Palmer Lake, near Negaunee, Mich., for which a great deal of equipment will be required as development work progresses. Most of this property was formerly owned in Detroit. For the present compressed air and electric current for operating the machinery will be supplied from the power house of the Volunteer mine, which is not far distant.

Some additions, which include the installation of considerable machinery, are to be made to the shops of the Chicago Grand Trunk Railway at Port Huron, Mich.

An increase in its capital stock to $100,000 has been made by the Pardridge Mfg. Company, Detroit, to provide for the growth of the business.

An electric hoist and motor driven air compressor are to be ordered for the property of the Houghton Copper Company, Houghton, Mich., as soon as plans for the new system have been fully determined upon.

Articles of incorporation have been filed by the Clark Engine & Boiler Company, Kalamazoo, Mich. The capital stock given is $200,000.

The construction of a pumping plant is under consideration by the authorities at Mulliken, Mich.

It is reported that the plant of the Aldine Grate & Man-

# THE MACHINERY MARKETS

tel Company, Grand Rapids, Mich., which was destroyed last week by fire, will be rebuilt for larger capacity.

A new hoisting engine designed to quadruple the capacity of the present system is now being installed in the power plant of the Chief Consolidated Mining Company, Houghton, Mich. It is a duplex 20 x 48 in. machine, with two 6-ft. drums. With the increased activity underground that will result from placing this unit in service, a number of other additions will need to be made to the equipment of the company.

Machinery will be purchased late this fall or early in the winter for the proposed electric power plant at St. Charles, Mich., to be operated by the municipality. A bond issue to cover the expense was recently authorized.

The W. J. Burton Sheet Metal Works, Detroit, is very busy on current orders and has been adding to its force of sheet metal workers and tinners. Other plants of this vicinity, including those that make a specialty of automobile bodies, hoods, fenders, gasoline tanks, &c., have at present about all they can do to keep up with contracts.

The erection of a large timber-cutting plant on Drummond Island in Lake Superior is being planned by A. L. French & Son, Iron Mountain, Mich.

The Michigan Bolt & Nut Works, Detroit, has been incorporated for $300,000.

The announcement is made from Saginaw, Mich., that the Schimmyer Harp Company, Chicago, will establish a plant there.

Preparations are nearly complete for the erection of a new plant at Saginaw, Mich., for the Jackson & Church Company, comprising pattern shop, 60 x 200 ft.; foundry, 100 x 350 ft.; machine shop, 90 x 325 ft.; finishing shop, 90 x 240 ft., and several other buildings, including a separate power house. Electric motor drive is to be used throughout. Steam heating appliances and probably a sprinkler system will be installed.

Plans are expected to be approved shortly by the Michigan Crank Shaft Company for a new factory building, approximately 65 x 140 ft., to be erected in Muskegon, Mich.

The Continental Motor Company, Muskegon, Mich., which has season contracts for gas engines from some of the leading automobile companies and has built up the largest business of that kind in the United States, is completing arrangements that will double its working floor space. Both day and night shifts will be operated continuously during the fall and probably during the winter also.

From Kalkaska, Mich., it is reported that the Freeman Mfg. Company is building a new factory to replace the one destroyed by fire.

The Benton Harbor Malleable Foundry Company, Benton Harbor, Mich., has under construction a new molding and annealing building 60 x 90 ft., but advises that all necessary equipment has been purchased.

The Arthur Colton Company, Detroit, Mich., has purchased a new factory site and will prepare plans in the near future for the erection of a modern machine shop for building special machines and taking care of its special pharmaceutical machinery. Details of equipment to be installed have not been decided upon.

A No. 42 Newten patent cupola has been installed in the foundry of Little Bros., Port Huron, Mich.

The Northern Engineering Works, Detroit, Mich., reports installing the entire equipment, consisting of two Northern cranes and a No. 60 Newten patent cupola, in the new foundry of the Power Specialty Company, Dansville, N. Y.

The Yates-Upholt Brass Company, Plymouth, Mich., is in the market for a complete foundry outfit for making small brass castings. The company will also purchase a double action press, turret lathe and some milling machinery.

## St. Louis

ST. LOUIS, October 17, 1910.

While inquiries continue to be fairly numerous, buying orders are mainly for small lots and trade in metal working tools is somewhat slow. The local railroads are displaying a little more interest, and besides the Missouri Pacific, the St. Louis and San Francisco is out with a list, though not nearly as large as that of the first named railroad.

The Copper Back Range Company, recently removed here from Omaha, has started a plant at 717 North Second street, for the manufacture of kitchen ranges. A complete installation of sheet working machinery has been purchased.

The Fayette R. Plumb Company has its new plant on the outer belt line well toward completion and has placed an order for its machine shop outfit, consisting of motor-driven machines made by the American Tool Works Company. The Plumb Company will manufacture axes, hatchets and other edge tools on a large scale. This is the first plant devoted to the making of such lines operated in the West. It is expected the company's enterprise will act as a nucleus which will draw other allied industries to this field. The construction of the buildings is strictly modern. One innovation is the use of white enamel brick for facing the inside shop walls.

The Fulton Iron Works has recently placed an order for two 20-ton Pawling & Harnischfeger cranes for use in an extension to the buildings now under construction.

One of the proming new enterprises here is the Carter Carbureter Company, that started manufacturing its patent automobile carbureter about a year ago. This company is meeting with good success and is much behind with its orders at the present time, and an increase of capacity will soon be required.

The Missouri, Kansas & Texas Railroad has started work on its new large freight warehouses, which will be pushed to completion as rapidly as possible.

The Brown Machinery Company states it is quite busy. There is a good demand for second-hand engines and boilers.

The Smith-Madison Aeroplane & Engine Mfg. Company, St. Louis, contemplates establishing factories in Kansas City and in California.

The Lumberman's Portland Cement Company, Kansas City, Mo., is being reorganized on the basis of an exchange of stock in the old concern at par for the bonds of the new company.

The Haffner Keg Works, Belleville, Ill., was recently destroyed by fire, causing a loss of $5000.

The Hillsboro Grain Company, Hillsboro, Ill., has been incorporated, capital stock $12,000. The president is A. J. Callahan; secretary, Isaac Hill; treasurer, T. H. King. The company will build a large elevator with switching connection with the Big Four Railroad. It will be operated by electric power.

The American Land, Timber & Stave Company, has arranged to establish a sawmill near Bradly's Ferry in Ouachita County, Ark. The company owns 1400 acres of oak timber which it proposes to convert into staves.

The Gulf Cooperage Company, Texarkana, Ark., has recently consumated the purchase of between 2,000,000 and 4,000,000 ft. of oak timber three miles northeast of the city. It will saw this timber into staves and ship them to the finishing mills in Texarkana. The machinery for this work will soon be installed.

The Pelican Oar Factory, Denham Springs, La., which was recently destroyed by fire, will be rebuilt according to the statement of the proprietors, Herlihy & Brown.

The plant of the Adeline Sugar Company at Franklin, La., was totally destroyed by fire October 8. The loss is estimated at $300,000. It was owned by Foster & Sprague and was one of the largest factories of the kind in the country, employing several hundred men.

The H. L. Judd Curtain Pole Mfg. Company, East Chattanooga, Tenn., whose plant was destroyed by fire October 5, causing a loss of $200,000, will rebuild the factory. The company employs 200 men and is the largest of its kind in the country. The loss was fully covered by insurance. The cause of the fire is unknown.

The flouring mill of J. H. Scott, Sweetwater, Tenn., was destroyed by fire of unknown origin October 1.

The flour and sawmills of W. T. Bolley at Jones Mill, Ky., were destroyed by fire October 6. The loss is estimated at $5000.

The cotton gin belonging to J. N. Pittman, Italy, Texas, was burned October 2, entailing a loss of $6000.

The cotton gin plant belonging to J. F. Mondy, near Greenville, Texas, was destroyed by fire October 1, causing a loss of $5000.

The plant of the Farmer's Gin Company, McKinney, Texas, was recently destroyed by fire, causing a loss of about $16,000, partially covered by insurance. The plant was a new one, having been built this fall.

The planing mill of William and G. D. Boyles, Palestine, Texas, was recently destroyed by fire, causing a loss of about $10,000.

The Falls County, Texas, commissioners will rebuild the Highbank bridge over the Brazos River, $18,000 in bonds having been applied for this purpose.

The electric light plant at Hempstead, Texas, is being pushed as fast as possible toward completion, and as soon as the building is erected the machinery will be installed.

The Fox-Harris Machine & Supply Company, Pine Bluff, Ark., is erecting a new building at Fourth and Louisiana streets, which will give it much better facilities for handling its business. The building will be of brick construction, 120 x 154 ft., one story, and will have a railroad track along the front and rear of the building to facilitate the receiving and shipment of material. It is expected that the building will be completed in time for occupancy by the first of the year.

The Neosho Foundry & Plow Works, Neosho, Mo., expects to move its wagon manufacturing department to

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SUPPLEMENT TO THE IRON AGE, OCTOBER 20, 1910

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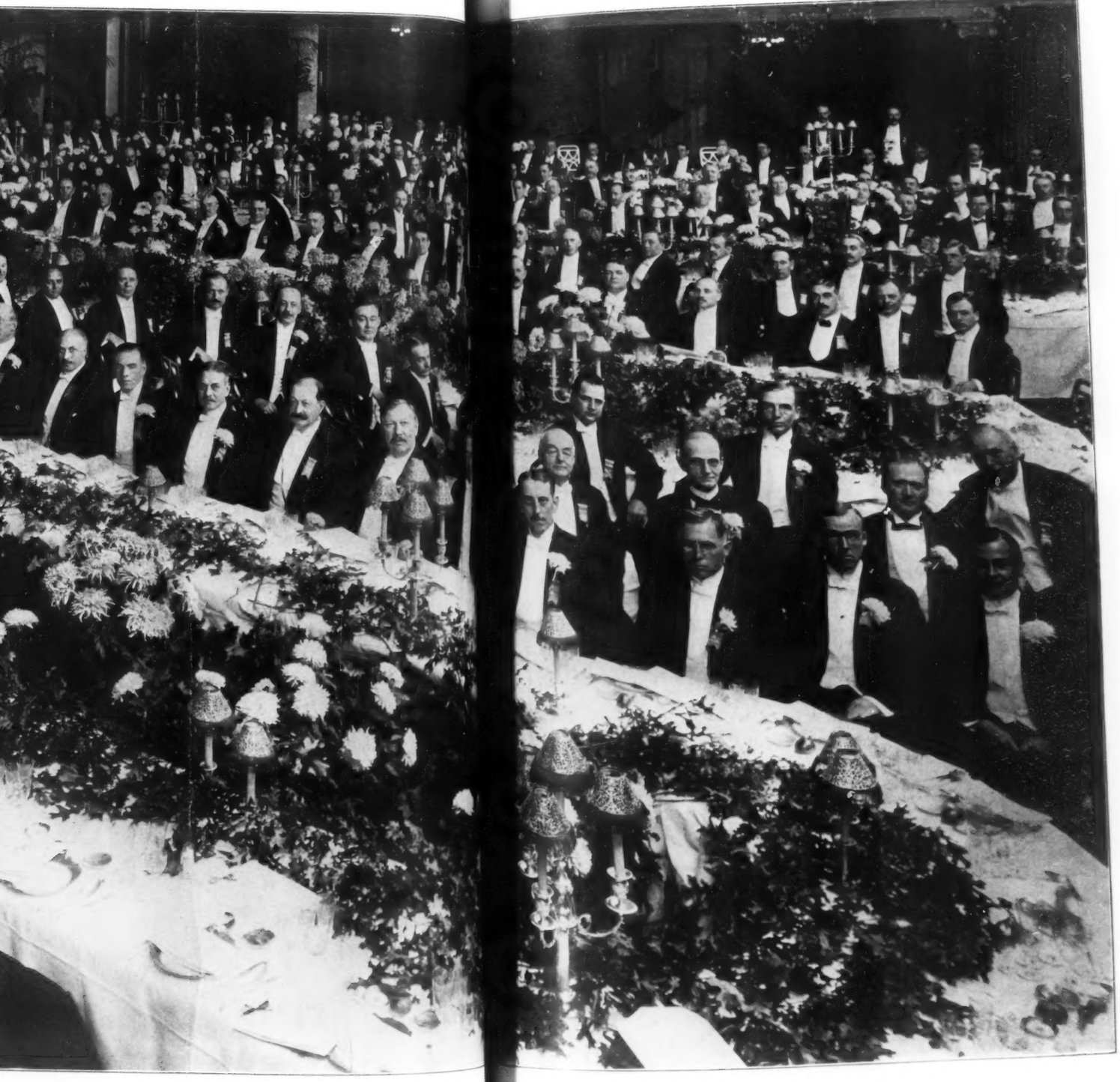

N IRON AND STEEL INSTITUTE AND THEIR GUESTS AT THE
NEW YORK, FRIDAY EVENING, OCTOBER 14

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Dallas, Texas. The rest of its manufacturing business will remain at its present location.

The firm of Turner & Barker, Atkins, Ark., have obtained a franchise from the municipality for the construction of an electric light plant to cost $10,000. Financial arrangements are now under way and the machinery equipment will shortly be purchased.

## Milwaukee

MILWAUKEE, WIS., October 17, 1910.

Conditions in the machinery trade here at present are rather uneven. Some of the larger manufacturing plants, in consequence of scarcity of orders, have reduced their shop forces, while others find themselves impelled by increasing business to take on more men. All of the plants, however, have enough contracts booked to keep them going in pretty fair shape for some time; and it is felt by the majority of business men that immediately following the November elections trade will settle down to a more stable basis. A good many contracts of considerable size are known to be pending in various parts of the country, figures on some of having been submitted as far back as last spring, and a fair percentage of these are practically certain to be taken by local machinery builders or dealers during the coming month. The revival in the automobile business reported from other market centers, so far as it relates to demand for parts, has not yet reached here to any appreciable extent; but in other cities of the State, such as Racine and Kenosha, considerable activity is manifested, with numerous additional work improvements being planned.

The Milwaukee Oil Pump & Tank Company, recently incorporated at Milwaukee, is manufacturing a very advanced line of self-measuring pumps and tanks for the storage, measuring and general handling of oils, gasoline, varnishes, &c. The line includes complete systems, both hand and power, for shops, factories, garages, &c. A. J. Roberts is president; C. B. Roberts, Jr., secretary; A. E. Ries, treasurer; and E. A. Bienenstok, general-manager.

The Cutler-Hammer Clutch Company, Milwaukee, is distributing through its sales offices an account of the service rendered by one of its lifting magnets, which was the first of the kind to be put out, having been in operation for the year at the Donora Works of the Carnegie Steel Company and subsequently replaced by a Cutler-Hammer magnet of the latest design. The company's business is steadily gaining in volume and prospects for the future are excellent.

The Sheboygan Light & Railway Company, Sheboygan, Wis., has started work on an addition to its plant, in which two units of 250 hp. each and a steam turbine generating 1,000 kw. are to be installed.

The plant of the Kaukauna Gas, Electric Light & Power Company, Kaukauna, Wis., will be improved and enlarged in capacity.

An appropriation has been made by the city of Menominee, Mich., to cover its share of the expense of constructing a new bridge over the Menominee River, which will be built as soon as the authorities at Marinette, Wis., take similar action.

A three-story extension 30 x 40 ft. will be made to the factory of the Thomas Coaster Toy Company, Sheboygan, Wis.

The Moore Adding Machine Company, Milwaukee, has been incorporated for $750,000 capital stock by R. L. Cooley, William Ness and C. P. Wetmore, to engage in the manufacture of computing machines.

The General Mfg. & Machine Company has been organized at Appleton, Wis., by B. P. Pollock, Geo. L. Hart and W. L. Scheel.

A woodworking factory is to be built at Sheboygan, Wis., by the Lakeside Craft Shops. A company to operate the plant was recently organized.

It is stated by L. I. Remond, secretary and treasurer of the Racine Tool & Machine Company, Racine, Wis., that contracts for all of the equipment needed in their new plant have now been placed.

The construction of an incineration plant is under consideration by the authorities at Racine, Wis., and a bond issue to cover the estimated cost will be voted on at the November election.

The Wisconsin Engine Company, Corliss Wis., has recently received a contract for three horizontal cross compound condensing Corliss engines from the Tidewater Portland Cement Company, Union Bridge, Md. The engines will be of different sizes, 23 in., 46 in. and 48 in., direct connected to a 925-k.v.a., 3-phase, 60-cycle alternator. They will be furnished with a special valve gear, cylinders and governors and will be designed for particularly economical performance and close regulation on a variable load.

## Indianapolis

INDIANAPOLIS, October 18, 1910.

The Unity Mfg. Company, Indianapolis, has been incorporated with $50,000 capital stock to do a general manufacturing business and make mechanical devices. The directors are H. C. Ostermeyer, Henry Nicoli, F. M. Reed, J. W. Brooks and O. J. Boulden.

The Chapman Steel Company, 24 Henry street, Indianapolis, has taken out a building permit for a one-story factory building at Madison avenue and the Belt Railroad tracks. It will be of frame and will cost $25,000.

The Prest-O-Lite Company, Indianapolis, is erecting a three-story addition to its factory, the equipment for which is being purchased by H. L. Bass & Co. of Indianapolis.

The Illinois Steel Company in getting license to operate in Indiana, according to the State law, certified that $1,132,297 of its capital stock of $18,650,000 is represented in its Lake county plant.

Ben R. Wowry has been appointed receiver for the Public Service Corporation of Mooresville, Ind., which supplies electricity and power to the town. The complaining stockholder alleges that the company is insolvent, that the plant is depreciating and expenses exceed the income.

The American Sewer Pipe Company has begun work on its new $125,000 plant at Brazil, Ind. It will manufacture there the largest sewer pipe ever made from clay.

Gary, Ind., four years old, has shown the greatest growth in post-office receipts of any city its size in the United States, and the Government is having plans made for a post-office building to cost $125,000. The first quarterly report, in 1906, showed receipts of $80.17; the report for the last three months, ending with September 30, this year, showed receipts of $9429.92. The increase was such that it has been necessary to move to larger quarters four times.

The M. Rumley Company, Laporte, Ind., manufacturer of threshing and other farm machinery, has put on a night force in order to increase the output of Oil Pull engines from two to three a day, and later in the year four a day. The foundry force of 75 will be increased, it is expected, to 175.

An explosion of a steam boiler October 11 wrecked the lumber and manufacturing plant of Witham & Bowen, Union City, Ind. The loss was $10,000.

The Take-Apart-Radiator Company, Greensburg, Ind., has been incorporated with $25,000 capital stock, to manufacture radiators and other articles. The directors are I. J. Hollinshe, R. Ray Hamilton and E. F. Shelley.

The Superior Ladder Company has been incorporated at Goshen, Ind., with $35,000 capital stock, to manufacture ladders and other articles. The directors are W. O. Valette, Aaron Hartzler and L. W. Vail.

Alfred Ellison has been appointed receiver of the Artificial Coal Company of Anderson, Ind. The company was organized three years ago to make fuel out of clay and chemicals. It did not fulfill the expectations of those who invested in it.

S. D. Helm & Co., Crawfordsville, Ind., manufacturers of sanitary hog and chicken fountains, brooders and other sheet metal products, is erecting a new factory building, 60 x 120 ft., for which considerable sheet metal working machinery will be purchased. Either gasoline or electric motive power will be used.

The Loshbough-Jordan Tool & Machine Company, Elkhart, Ind., is erecting a new machine shop building, 36 x 115 ft., into which it will remove the latter part of November. No additional equipment will be purchased at the present time.

The Motsinger Device Mfg. Company, La Fayette, Ind., has plans prepared for the erection of four new factory buildings. The main building will be 50 x 150 ft., in addition to which there will be a foundry, forge shop and boiler room building, 25 x 100 ft.; a stock and shipping room, 55 x 150 ft., and an office building, 32 x 32 ft. The company is now located at Pendleton, Ind., but was recently induced to remove to La Fayette, Ind., through the efforts of the Young Men's Business Association of that city. The company expects to be located in its new quarters on or before January 15, 1911.

The Wallace Foundry & Machine Company, La Fayette, Ind., has increased its capital stock from $20,000 to $40,000. The increase will be used for additional working capital and to purchase real estate and buildings now occupied by the company.

The Jacobson-Peterson Company, South Bend, Ind., is erecting a new warehouse and office building, 38 x 180 ft., three stories and basement, which will be equipped with electric elevators, bundle chutes and heating plant.



Engineers, PITTSBURGH, PA.

# THE MACHINERY MARKETS

## Toronto

TORONTO, October 14, 1910.

In Ontario the machinery trade continues to be at least up to expectations. Competition from outside is a larger factor than ever. So far as can be gathered from indications other than statistics—of which, of course, the trade of the moment cannot yet be the subject—the importation of machinery keeps on showing increase over that for the corresponding period of last year. The monthly report of the Canadian Department of Trade and Commerce covering July was issued this week. Its showing reflects a marked growth in the imports of machinery. Under the heading Machinery and Machines, the imports for July amounted to $1,630,770 for dutiable articles and $104,501 for free articles, as compared with $1,056,381 and $107,962, respectively, in the month of July, 1909. For the four months ending with July, the imports of machinery, dutiable and free together, amounted to $7,676,177, as compared with $4,534,628 in the corresponding period of 1909. Of electrical apparatus, an item not included in the above, the imports for the same four months amounts to $1,679,106, as compared with $1,100,615 in the corresponding part of 1909. Engines with boilers, not including railroad engines, were imported in the four months to the value of $837,978, as compared with $527,215 in the corresponding four months of 1909. In the four months of this year the imports of agricultural implements amounted to $1,026,076, as against $916,577 last year. This year the automobiles imported in the period under review amounted to $1,714,979, as against $604,092 in 1909. And, as has already been said, it looks as if the currents of importation were running as strong now as they were in these first four months of the fiscal year. It is further to be noted that the bulk of the gain is going to the United States.

The machinery trade, like every other trade, has for months been hampered by deficiency of railroad service, owing to the strike of the Grand Trunk trainmen and conductors in midsummer. The railroads have made progress in the work of relieving the congestion, and delivery is not so retarded as it was.

The Toronto *News* of Thursday makes the statement editorially that the representative of an important Chicago manufacturing concern came to Toronto this week to arrange for the purchase of a 12-acre site there on which to establish Canadian branch works, and that he was so struck with the advocacy of American reciprocity by Government newspapers in Toronto that he wavered in his purpose. Reciprocity arranged, there would probably be no longer a motive for establishing a Canadian branch, as the duty on such articles as his company makes might be greatly reduced or possibly removed altogether.

The plant the Canada Steel Company will erect in Hamilton, Ont., will consist of seven stands of 12-in. rolls, including one stand of splitting rolls. It will be operated entirely by hydroelectric energy, 500 hp. being required. There will be continuous heating. Small angles, reinforced concrete bars, shapes and sections of every variety that can be made from high carbon steel will be turned out. Old rails will be the raw material used, but if soft billets can be obtained at a sufficiently low price the company may manufacture merchant steel bars. It is expected that the plant will be ready for operation by the beginning of next March. The building in which the electrical machinery is to be set up will take the longest time. The Canadian market for such products as the company proposes to manufacture is at present a large one and is certain to expand with the growth of the country. Hamilton was selected, not because it afforded exceptional advantages in the way of cheap power or accessibleness of raw material—for many Ontario towns and cities will be on the transmission lines of the Hydro-Electric Power Commission and old rails are quoted f.o.b. at all points on the railroads—but because Hamilton is an extremely convenient point for the distribution of products such as the company is to make. Any steel billets the company may use will probably have to be imported, as the Steel Company of Canada, whose furnaces are in Hamilton, will be likely to find a sufficient demand for its raw steel from the rolling mills in its own system of industries.

The Canadian Northern Railway Company is planning for the construction next year of repair shops and an elevator at Parry Sound, Ont. The elevator is to have a capacity of 500,000 bushels. Dock improvements at this Georgian Bay port will be rendered necessary for the carrying out of the undertaking, and the Dominion Government will be asked to spend $200,000 on this account. The outlay of railroad company and Government there would amount to about $400,000.

The Commissioners of the Transcontinental Railway are calling for tenders for the construction of the freight sheds and storehouses at Lake Superior Junction, Ont.; Redditt, Man., and Springfield, Man. Lake Superior Junction is the point on the National Transcontinental Road at which the Grand Trunk Pacific branch line to Fort William connects. Information can be obtained from Gordon Grant, chief engineer, Ottawa, Ont. Tenders will be received up to noon, November 8.

Geo. Hachbarn & Co., furniture manufacturers, Berlin, Ont., are building a large three-story addition to their factory.

Alderman McGovern of Port Arthur, Ont., who was visiting in cities of eastern Canada for three weeks, has returned home with the news of plans for doubling the capacity of the Atikokan Iron Company's furnace in Port Arthur and for establishing a foundry in the city to take up a considerable part of the furnace output.

A company that proposes to build and operate a knitting factory in St. Thomas, Ont., asks for a 10-year loan from the city of $30,000. It promises to erect a three-story building, 50 x 196 ft., the cost to be $30,000, and to install $30,000 worth of machinery. It further asks for a fixed assessment of $10,000. The Industrial Committee of the City Council is favorably inclined toward the proposal. The company is described as one engaged in the manufacture of woolens on a large scale in another Canadian town and having excellent financial standing.

Frank Forsyth recently resigned the position of mechanical superintendent at the works of the Lundy Shovel & Tool Company, Peterborough, Ont. He is succeeded by Peter H. F. Spies, late mechanical engineer with Siemens, Ltd., London, England. Mr. Spies will be assisted by W. Jones, late foreman shovel maker with Henry Mills, Victoria Shovel Works, Worcester, England.

The Canadian Government Trade Commission in New Zealand reports that the Canadian machinery received there is too light. This criticism applies to steam machinery and dairying apparatus. It is by the importing trade, however, and not by the consumer that this fault is found. The commissioner adds that as the demand for a different type develops the New Zealand market for Canadian machinery will gradually expand under the tariff preference conceded to Canada. He expresses the opinion that some good live agents could work up a business in automobiles of good appearance, moderate price and good hill climbing faculty. Motor buggies also are wanted, he says, at a fair price.

In the first week of October permits were issued for the erection of new buildings in Toronto of an aggregate value of $340,000.

The contracts let for work on the new General Hospital in Toronto already aggregate $1,000,000.

The Dominion Bridge Company has the contracts to build the bridges for the Canadian Northern Railway Company over the Trent River at Trenton, Ont., and over the Moira at Belleville, Ont.

The Toronto Electric Light Company is erecting a five-story building on Esplanade street, to cost $140,000.

The cheese box factory of E. H. Mann & Co., Peterborough, Ont., was burned October 8, and the machinery was badly damaged.

It is announced that a 200-ft. extension will be made to the buildings of the Canada Iron Corporation at Liverpool, N. S. There is a rumor that a new blast furnace will be added to the company's works there in the near future.

The Diamond Glass Company has decided to build a large factory in Hamilton, Ont.

The Lundy Shovel & Tool Company, Peterborough, Ont., has a drilling plant in readiness to bore for natural gas on its property to use in its own works. It has applied to the City Council for an exclusive franchise to lay pipes in the streets and supply natural gas to customers. A representative of an American syndicate is also seeking to obtain the same exclusive franchise.

The Niagara Bedstead Company, Buffalo, N. Y., will locate a Canadian branch of its works in Brantford, in connection with the Hame & Nott Company. Seventy-five hands are to be employed and the city is to grant a fixed assessment for a specified period.

The Collingwood Shipbuilding Company, Collingwood, Ont., has closed a contract for a steel passenger and freight steamship for the Ontario & Quebec Navigation Company of Picton, Ont. It is to cost $175,000. It will be propelled by twin screws, driven by two quadruple engines of a total of 2000 hp.

It is stated that the Symmes Construction Company, Niagara Falls, Ont., has made arrangements to build a power plant at Sandy Falls in the Porcupine mining field of Northern Ontario, 8000 or 9000 hp. to be produced.

The Port Arthur Wagon Company has deposited $10,000 to the credit of the municipal corporation of Port Arthur, Ont., to guarantee the building and operating of the manufacturing works it has undertaken to establish in that

# THE MACHINERY MARKETS

city. Work has been begun for the preparation of the site.

Allen Hazen, a New York expert engaged to investigate Ottawa's water supply, has reported that the Ottawa River, the present source of supply, is contaminated by sewage and that 80 per cent. of the water pumped is lost by leakage. He recommends that McGregor's Lake be the natural reservoir drawn upon or that a complete filtration plant be installed. The adoption of the first recommendation would call for an expenditure of $2,400,000 on works, and the adoption of the second would call for an expenditure of $2,300,000. The City Council received the report, but left action upon it for a subsequent meeting.

At its meeting to be held next week the Municipal Council of Weston, Ont., expects to award the contract for the construction of a transformer station for the service the Hydro-Electric Power Commission will supply.

The distribution system of London, Ont., is being pushed to completion as rapidly as possible, the desire being to have everything in readiness to receive and distribute power from the transmission line of the Hydro-Electric Power Commission by December 1.

To the Canada Foundry Company, Toronto, has been awarded the contract for the steel work of the Blackburn Building, now being constructed in Ottawa.

The Montreal Water & Power Company, which is now supplying 157,000 consumers in Montreal and its suburbs, has placed a contract with the New York Continental Jewel Filtration Company for a water purification plant of 30,000,000 gal. capacity. The contract calls for low lift pumps to draw the water from the St. Lawrence at the present pumping station, and also for sedimentary basin and filters.

The Canadian Billings Spencer Works' plant at Welland, Ont., is to be extended.

Kemp & Craise are about to erect a large garage and repair shop in Petrolia, Ont.

The Sherbrooke Railway & Power Company's power plant at Sherbrooke, Que., is approaching completion, and is to be in commercial operation by December 1. Of the 4000 hp. that will be developed, 800 will be used to operate the street railroad and the remainder will be available for industrial purposes. Several important contracts have been made for supplying manufacturers on the company's transmission line, which will extend over a radius of 30 miles.

The carriage factory of S. Fillimore, Southampton, near Amherst, N. S., was destroyed by fire. Total loss, $35,000, on which the insurance was only $6,000.

The Dominion Coal Company is calling for tenders for the erection of a new washing plant to replace the one burned at Port Marien, N. S., three years ago. It may be that a site at Louisbourg will be selected for the new plant. Tenders are being asked also for the construction of a 150-ft. brick stack at No. 2 colliery. A new coal pocket for the storage of coal at that colliery is also to be constructed.

Telfer Bros., Collingwood, Ont., have laid before the municipal corporation there a proposal to take over the disused furniture factory that is on the town's hands. The firm states that its manufacturing business has outgrown its present plant, notwithstanding that additions are made to the latter nearly every year. For the purposes of the business $20,000 would have to be expended on the factory before the machinery could be moved in. Mr. Radford, who has been negotiating with the town for the establishment of a steel industry there, is also endeavoring to come to an arrangement with the town for the acquiring of the furniture factory for use in the manufacture of cutlery. He says that he is associated with H. B. Crandall, president of the Crandall Cutlery Company of Bradford, Pa., in this proposed Collingwood undertaking.

The North American Furniture Company, Ltd., Owen Sound, Ont., has been incorporated with $100,000 capital stock. The company is erecting a new plant, the main building of which is 60 x 400 ft., four stories, together with a boiler room, 40 x 70 ft., and a kiln, 80 x 100 ft. It will be of mill construction and will be equipped throughout with automatic sprinklers. Two boilers with a 250-hp. engine are now being installed, but the company will be in the market in the near future for a full line of equipment for the manufacture of dining room and bedroom furniture.

## The South

ATLANTA, GA., October 17, 1910.

The steady, conservative development which marks the progress of Southern industries is bringing out for the fall trade a sufficient number of inquiries to keep dealers fairly busy, and in some of the principal market centers a good many orders have recently been entered. As a whole, however, business is still below normal for the season, and the promise of activity offered at the beginning of autumn has not been fully kept. While manufacturers have a good deal of work in their shops and mills, inclusive of repairs to machinery, they appear to experience difficulty in closing pending contracts until just before the equipment is actually needed for installation, and this keeps the trade somewhat uncertain as to the future, with consequent halting of contemplated plans for extensions and betterments.

For construction material, including contractors' outfits of all kinds, there is a first rate demand; and drainage projects are also responsible for some buying. Miscellaneous purchases, however, still constitute the principal support of the market, and these are quite uniformly scattered among a great variety of industries.

The Westinghouse Air Brake Company, Pittsburgh, Pa., has established a new district office for Southern business in the Candler Building, Atlanta, Ga.

Electric motors will be installed in the plant of the Massee Felton Company, Macon, Ga., and operated on current furnished by the Central Georgia Power Company.

It is stated that the largest automobile truck in the South has just been put in commission by the Cathcart Transfer & Storage Company, built by the Grabowsky Power Wagon Company for use in Atlanta, Ga.

It is reported from Gainesville, Ga., that the Blue Ridge Power Company has been organized to build a hydroelectric plant on the Chattahoochee River, Wm. A. Carlisle being named as the principal incorporator.

It is stated at Glen Alpine, N. C., that J. D. Pitts of that place is preparing to build a hydroelectric plant of 200 kw. on one of the streams in that vicinity.

The project of constructing a municipal power and lighting station is under consideration at Greensboro, N. C.

A new hydroelectric unit is to be placed in the city power plant, at Walhalla, S. C.

The construction of a modern water works system is under consideration by the authorities at Arlington, Tenn.

By order of the city officials, plans for a large new pumping station have been prepared at Chattanooga, Tenn., and the matter of construction may be decided in the near future. Estimates thus far made include expenditures of $11,928 for boilers, $152,833 for pumping and electrical machinery, $5600 for traveling cranes and $9115 for a standpipe and tanks.

Gamble Bros., Louisville, Ky., are reported to have arranged for the installation of a sprinkler system in their woodworking plant.

Advices from Louisville, Ky., are to the effect that plans for a large plant are being contemplated in behalf of the American Automobile Mfg. Company, but definite information is lacking.

The plant at New Albany, Miss., formerly occupied by the New Albany Furniture Mfg. Company will be operated jointly by the International Furniture Company and the Favorite Washer Company. Some improvements are being effected.

The contract for electric generators to be installed in the municipal power plant at Thibodaux, La., has been let to the Ft. Wayne Electric Company, Ft. Wayne, Ind. They will be driven from oil engines supplied by the Diesel Engine Company, St. Louis, Mo.

A bond issue covering the expeditures to be made for a water works system has been authorized at Patterson, La.

The Champion Wire & Iron Works, Louisville, Ky., has recently completed the erection of a new plant which it is now occupying.

The Corinth Chair Company, Corinth, Miss., will shortly move its plant to Mobile, Ala., where 10 acres of ground have been purchased. The company's manufacturing capacity will be materially enlarged.

## The Southwest

KANSAS CITY, MO., October 17, 1910.

Business thus far this month has been generally better in nearly all sections of the Southwest, and the outlook grows more encouraging from one week to another.

One of the principal influences affecting the market for building material, construction equipment and machinery for installation in new or improved plants is the work of the commercial organizations of this section in promoting new industries, public utilities and the growth of established manufacturing institutions in the various cities and towns in which they are located. The record of the first nine months of the year has been a phenomenal one in this respect, and there are signs that the coming winter will witness results of even greater magnitude than any heretofore achieved.

It will pay manufacturers throughout the country, who are striving for a share of Southwestern trade, to keep in touch with the work of the local commercial associations and, so far as possible, lend them assistance in securing information of the character that enables them to proceed

# THE MACHINERY MARKETS

to the best advantage in promoting industrial development. Wherever a local plant is established, it comes into competition with outside concerns in the same line of production, but as the manufacturing interests of the Southwest become more diversified the purchasing power of the various communities is so far increased that the broadening of the market is of general benefit.

J. C. Worley & Co., Kansas City, are in charge of plans for an improved municipal pumping and water distribution system at Cherryvale, Kan., the cost of which will approximate $100,000.

The installation of a pumping engine of 3,000,000 gal. daily lift, with Corliss valve gear, has been decided upon by the municipal authorities at Junction City, Kan. This will more than double the present capacity of the waterworks system.

One of the plants in this section in which great activity prevails at present is that of the Ottawa Car Works, Ottawa, Kan., where more men are being added to the operating force as skilled mechanics and woodworkers can be secured.

Preparations are being made at Camden, Texas, to erect a timber cutting plant of steel frame construction for the W. T. Carter Lumber Company, which will be the largest and most modern of its kind in the State. All of the machinery will probably be driven by means of electric motors, and the plans provide for a steam power plant of large capacity.

Improvements which will necessitate the purchase of some new equipment are to be made in the waterworks system at Anthony, Kan.

It is reported from Miami, Ariz., that the Inspiration Copper Company is preparing to build a 5000-ton concentrating plant. The site, however, remains to be selected and none of the equipment is known to have been ordered.

Some electrical apparatus for the city pumping station, including a large motor, will probably be purchased in the near future at Hobart, Okla.

Steps will need to be taken at once to install a new power plant for the Clarksville Light & Power Company, Clarksville, Texas, to replace the one that recently burned.

A car building and repair plant consisting of several large buildings, the initial unit of which will be 96 x 216 ft., will be built in Oklahoma City, Okla., by the Oklahoma Railway Company.

An ore reduction plant of 100 tons capacity is nearing completion at Kingman, Ariz., for the 'Frisco Mines & Power Company's Tragedy mine.

The contract for a 650-ft. steel bridge across the Cimarron River, near Stillwater, Okla., has been awarded the Weatherford Machine & Foundry Company, Weatherford, Texas.

Improvements of quite an extensive character are to be made in the electric power and pumping station operated by the municipality at Sallisaw, Okla.

It is reported from El Paso, Texas, that the new ore concentrating plant and smelter of the El Paso Tin Mining & Smelting Company is practically completed and will be put in operation about November 1.

The 300-ton furnaces of the Calumet & Arizona Mining Company, at Douglas, Ariz., will be enlarged so as to give them a capacity of 500 tons each, making the aggregate capacity of the plant 3000 tons.

Advices from Pachuca, Hidalgo, Mexico, are to the effect that the plant of the Compania Minera Santa Ana y Anexas is now completely equipped for electrical operation. Among the latest machinery installed is a large hoist built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

It is reported from Hallett, Okla., that the purchase of a gas power plant of 100 hp. has been decided upon by the Lewis Industrial Company of that place.

Machinery has been ordered by the Sierra Consolidated Mines Company for a steam driven electric plant at Durazno, Chihuahua, Mexico, and other improvements are contemplated.

The Flagstaff Lumber Mfg. Company, Flagstaff, Ariz., is building the largest timber cutting and finishing plant in that part of the country, equipped with modern power and operating machinery, including two 20 x 30 in. engines. It is nearly ready to operate.

Some new machinery, including a cyanide plant, is to be installed on the property of the Midnight Test Mining Company, Walker, Ariz., and operations resumed. The work at this mine was suspended some time ago, except for the pumping plant, which was kept going in order to keep the lower workings free from water.

The plant of the Electric Light & Power Company, Newton, Kan., which is equipped with two General Electric alternating current generators of 250 kw., driven by the C. & G. Cooper Company's engines, will be doubled in capacity. A condensing outfit is also to be installed.

It is reported from Drexel, Mo., that an electric power plant will be installed there by A. J. Harbison.

An engine driven power plant of 60 kw. is to be installed at Benson, Ariz., by J. E. Collins, whose address is given as Tucson, Ariz.

Plans and specifications covering the installation of a modern system of water works have been prepared at Douglas, Ariz.

Muskogee Industrial Development Company, Muskogee, Okla., has succeeded in raising a fund of $300,000 and has signed contracts with four different companies for the removal of their plants to Muskogee. There will be a stove plant, agricultural implement works, window glass plant and a furniture factory. The work of construction of the different plants will be commenced within the next 30 days.

W. C. Worthen, Pratt, Kan., has sold his interest in the Pratt Machine Shops, and Mawdsley & Mawdsley are now the sole proprietors.

The directors of the Provident Association, Topeka, Kan., will start a box factory on the corner of Fourth and Jackson streets for the purpose of furnishing employment to men and boys temporarily out of work.

G. W. Hill & Sons, Pittsburg, Kan., have built an extension to their marble plant and will install a 3-ton steel traveling crane and a runway, 175 ft.

At a fire which took place October 7, over one-third of the American Metal Company's large plant near La Harpe, Kan., was destroyed. The loss will run up far into the thousands. The cause of the fire is unknown.

Three of the large mills of the E. I. Dupont de Nemours Powder Company, located 5 miles north of Columbus, Kan., were blown up October 7. Over 1000 bbls. of powder were destroyed. The loss is over $25,000.

The Tulsa Stock Yards & Commission Company, Tulsa, Okla., will erect and equip a large institution at Tamaha, Okla. It will be located along the line of the St. Louis & San Francisco Railroad. Natural gas will be used.

The plant of the Oklahoma Iron Works, Tulsa, Okla., suffered extensive damage by fire October 8. It is the largest foundry in the city and employs 200 men.

The elevator of the Independent Grain Company, at Weatherford, Okla., was totally destroyed by fire October 10, causing a loss of $15,000, about two-thirds covered by insurance. The cause of the fire is unknown.

The Jones-Everett Machine Company, Ardmore, Okla., has been organized to do a general machine shop and foundry business. The company has installed a 36-in. cupola and will purchase other equipment.

## The Northwest

ST. PAUL, MINN., October 17, 1910.

Purchases of machinery and other apparatus at the present time are largely for the account of plants engaged in the production of equipment of material for building purposes and the construction of large private or public works. Along these lines the trade of Northwestern manufacturers, dealers and sales agencies, up to now, has exceeded expectations, being strongly contrasted with the disappointing conditions in some other fields of industrial progress. Business of all kinds, however, considered as a total, seems to be gradually gaining ground, and the money stringency which was threatened some time ago has not developed, despite the amount of funds needed for moving the crops. For fabricated metal products an excellent demand still exists, and much new business is reported to be in prospect for the immediate future. Consequently local shops that specialize in such material are buying quite freely for their own needs.

Aside from the sources of inquiry above noted, shop tools remain slow of sale.

Power and electrical machinery is being placed in considerable quantity, as heretofore, and installations everywhere are being hurried forward. There has recently been so much of this work requiring completion that manufacturers find difficulty in securing competent men for erecting machinery and placing it in running order.

The Diamond Iron Works, Minneapolis, has had a very successful year thus far in the sale of its horizontal resaw, which possesses a number of features that commend it to users, including an arrangement by means of which the table remains stationary and the saw is raised and lowered to cut different thicknesses.

Lindsay Bros. of Milwaukee, who are among the largest dealers of the Northwest in agricultural implements, farm engines, &c., have arranged for the construction of a new warehouse in Minneapolis.

The Carnegie Fuel Company, besides making the improvements at Superior recently noted in *The Iron*

# THE MACHINERY MARKETS

*Age*, has purchased from the Lowry Holding Company, Duluth, Minn., property on the water front at West Duluth, which will be utilized for the construction of additional docks and handling machinery to provide 1,000,000 tons storage capacity.

One or more small pumping units will be required some time this winter at Madison Lake, Minn.

The Power Engineering Company, Minneapolis, has presented a report to the city authorities at Marshalltown, Iowa, by whom it was engaged for the purpose, outlining plans for a hydroelectric plant to be used in municipal lighting service.

The Minneapolis Steel & Machinery Company, Minneapolis, has met with excellent success this year in the sale of its Muenzel gas producer and engine plants for electric power and lighting service. There are now so many installations of these sets at various points in the Northwest that the service record of one is quite likely to sell another in the same vicinity.

The contract for another electric generating unit for the municipal power plant at Alexandria, Minn., the prime mover of which will be an Ideal engine like the one previously installed, has been let to A. L. Ide & Sons, Springfield, Ill.

In a letter from Moscow, Idaho, it is stated that a new plant will probably be built this fall or in the spring by the Michaelson Mfg. Company, whose works for the production of harvesters are now inadequate to the demand.

The Missoula Light & Water Company, Missoula, Mont., has bought the electrical plant at Victor, Mont., and is planning to build a line of power stations between Missoula and Hamilton.

The Westinghouse Electric & Mfg. Company of Pittsburgh, Pa., is doing a good business in the western end of this territory through an office maintained in the Lewiston Building, at Butte, Mont.

A bond issue has been voted at Carter, S. D., to provide funds for a complete water works system, including pumping machinery.

Plans and specifications for a new filtration plant were recently completed at Grand Forks, N. D., and decisive action in the matter will be taken shortly.

A company is being organized at Bozeman, Mont., by J. C. McCarthy and Dr. Carl Schroeter, to erect a gas plant in accordance with the terms of a franchise recently granted.

A bond issue of $75,000 to pay for the installation of water works is proposed at Lewiston, Mont., and the probabilities are that it will be authorized. A plant is now in service, but has proved inadequate to the needs of the city.

Funds will shortly be available at Libby, Mont., for the construction of a municipal water system.

The Northern Welding & Mfg. Company, Minneapolis, Minn., is considering the establishment in the near future of a branch plant in Duluth, Minn., but advises that a definite date has not been decided upon. The company is at present making arrangements for the erection of a new plant in Minneapolis, which it expects to have completed about the first of the year.

## Southern Texas

AUSTIN, TEXAS, October 14, 1910.

An unusual amount of activity in the establishment of new public utility plants and the improvement and enlargement of existing ones is taking place in towns and cities all through the Southwest and Mexico. Many towns of comparatively small size are inaugurating modern systems of water works and sewers and electric light plants. This spirit of public improvements is particularly being manifested in Mexico, where some of the larger cities were not provided with modern utility systems and plants until within the last few years. The new era of improvements along these lines has spread to all parts of that country. One effect has been to create a large demand for water works and electrical machinery and pipe. In southern and southwestern Texas, where extensive agricultural development is in progress, the growth of towns has been remarkable in the last few years, and many of these places have taken steps to provide themselves with modern utilities.

The Texas Railroad Commission has issued formal notice that it will take up and consider the proposition of readjusting the rates applying on steel and iron rails and fastenings November 10. It is proposed to establish a maximum rate of $2.10 per ton from Galveston, Texas City, Velasco, Port Arthur and Sabine to points in Texas common point territory.

The Texarkana Clay Products Company is making good progress with its plans for the erection of a plant at Texarkana, to cost $100,000, for the manufacture of bricks and pottery.

The Flatonia Ice, Water & Electric Company expects to have the installation of its new electric light plant at Flatonia, Texas, finished by the latter part of November.

The erection of a plant for the manufacture of fireproofing material at Houston is under consideration by the National Fireproofing Company, Pittsburgh, Pa. It is stated that about $100,000 will be invested in the enterprise.

At an election held at Denison on October 8 it was voted that the city shall issue $50,000 of bonds for the purpose of extending and improving the water works system. It is planned to install new machinery in addition to laying new mains.

The town of Marion, Texas, is arranging to install a water supply system. The water will be pumped into a standpipe to be located at an elevated point on the Guadalupe River, six miles from town, and the water brought in through a pipe line that will be laid that distance.

The glass plant that is being constructed at Texarkana by the Texas Glass Company will cost about $75,000. The company has a capital stock of $100,000.

The City Council of New Braunfels, Texas, has taken preliminary steps toward the installation of a hydroelectric plant on the Comal River, near town, and to erect a new pumping plant and station for the water works system. A dam will be constructed across the river to form a reservoir from which the initial power for generating the electrical energy will be obtained. Another standpipe will be erected to hold a reserve supply of water for the town.

It is announced by E. H. Young, Galveston, whose large cottonseed grinding and crushing plant in that city was recently destroyed by fire, that he will rebuild it, but that he has not definitely decided whether he will locate it at Galveston, Texas City or Port Arthur.

P. W. Quiney, construction quartermaster of the United States Army, Fort Sam Houston, Texas, is receiving bids for the construction of a 300,000-gal. steel tank and trestle and an extension of the water distributing system at that military post.

Arrangements are being made by the City Council of Lubbock, Texas, for the construction of a water works plant and distributing system. E. L. Dalton of Dallas, is the engineer who is in charge of the proposed improvement.

The Lueders Water Supply Company has adopted plans for the construction of a water works plant and distributing system for Lueders, Texas. The water supply will be obtained from a reservoir to be formed by the construction of a dam across Cottonwood Creek.

The Pecos Light & Ice Company will enlarge its plant at Pecos, Texas. Considerable machinery will be installed.

The Temple Iron Works has made arrangements for the removal of its plant from Temple, Texas, to San Angelo. A site and a cash bonus was given the company by San Angelo to obtain the new industry.

The Pecos & Toyah Lake Irrigation Company, which was recently organized with a capital stock of $1,500,000, has adopted plans for the construction of a large system of irrigation near Pecos, Texas. The main canal will be 65 miles long and will provide a water supply for irrigating about 22,000 acres of land. Among the stockholders in this company are F. E. Dobbins, Charles A. Loomis and L. H. Baker of Kansas City, Mo., and Frederick W. Taylor of Lincoln, Neb.

The municipal authorities of Elkhart, Texas, are arranging to issue bonds for the construction of a water works system and electric light plant.

A peanut factory is being installed at Nixon, Texas, by Dew Brothers of that place.

The City Council of Hearne, Texas, will soon submit to the vote of the people of that place the proposition to issue bonds for the construction of a water works plant and distributing system.

K. MacKinzie, Chicago, is organizing a company at Luling, Texas, for the erection of a creamery at that place.

The contract for the construction of a steel viaduct across the Trinity River and bottoms to connect Dallas and the Oak Cliff suburb has been let by the city to Bernard Corrigan, Kansas City, Mo., for $425,000.

The Toyah Valley Alfalfa Milling Company is erecting a new alfalfa mill at Balmorhea, Texas, at a cost of $25,000. The mill is built of steel throughout and is of 50-ton capacity.

William Heinz, Nara Visa, N. M., contemplates erecting a large pickle plant at Tucumcari, N. M.

The Alamogordo Water Power Company of Alamogordo, N. M., will install a hydroelectric plant of 800 hp. in Box Canyon, near Highrolls. It will construct transmission lines to several points in that section and furnish power to industries and farmers.

R. L. Knowles and associates of Farmington, N. M., have adopted plans for the construction of an ice and cold storage plant at Farmington. They will also make improvements to their electric light and power plant.

J. E. Collins, Tucson, Ariz., is making good progress with

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his plans for the installation of an electric light and power plant at Benson, Ariz.

Weaber & Sherkan, Lancaster, Pa., are having plans prepared for a sausage factory which they will erect at Juarez, Mexico, at a cost of $50,000.

The Mayo River Power & Land Company has had surveys made and adopted plans for the erection of three large hydroelectric plants in Mexico. One of the proposed plants will be situated on the Mayo River in the State of Sonora, another on the Humaya River in the State of Sinaloa and the third on the Santiago River in the territory of Tepic. The three plants will have an aggregate capacity of 300,000 hp. It is stated that the company has contracted to provide electric power for operating the mountain division of the Southern Pacific Railroad of Mexico, that is now being constructed down the Pacific Coast of that country and across the Sierra Madres to Orendain, where it will connect with the National Railways of Mexico. The Mayo River Power & Land Company's principal office is in Denver, Colo.

The Valley Reservoir & Canal Company, Chapin, Texas, will soon let the contract for the installation of a large pumping plant. The main canal of this company is now being constructed. When finished the system of irrigation will furnish water for about 200,000 acres in the lower valley of the Rio Grande.

## The Farther Central West

OMAHA, NEB., October 17, 1910.

While buying at the present time is chiefly from the general industrial field, metal working plants are coming into the market more and more for machinery, material and supplies, with the result that jobbers and dealers in the several lines have recently put forth greater efforts to secure business than was observable last month, when conditions were not felt to be ripe for any very strenuous selling campaign. Railroad purchases are also becoming a feature of the situation. These have thus far been chiefly for the account of storekeepers' stocks and the repair outfits of the various terminals and junctions or division headquarters; but it has a very appreciable effect in encouraging general activity owing to the close connection existing between all railroad work and other phases of the industrial life of this section.

The Des Moines Bridge & Iron Works, Des Moines, Iowa, has the contract for an elevated steel tank of 70,000 gal. and other equipment for the municipal water system to be installed at Oakley, Kan.

The Dubuque Boat & Boiler Works, Dubuque, Iowa, will furnish three large steel hull vessels for Government service on the lower Missouri River.

The Park Dam Company, recently organized at Eldora, Iowa, is planning the construction of a hydroelectric plant to furnish power and lighting for that community and industries in the vicinity.

It is reported from Mason City, Iowa, although without confirmation, that the Upper Iowa Power Company will install at Decorah an electric generating unit of 600 kw., in order to provide operating current contracted for by a Missouri corporation which will develop iron mines in the vicinity.

The Waterloo Malleable Iron Works, Waterloo, Iowa, is laying the foundations for the additions to its plant, comprising of the grey iron foundry 100 ft., malleable iron foundry 100 ft. and machine shop 80 ft., besides smaller buildings to be used for various purposes in the operation of the establishment.

Construction contracts covering a three-story packing house, 100 x 150 ft., the machinery in which will be driven by electric motors, are to be let about November 1, by the Corn Belt Packing Company, Ft. Dodge, Iowa.

N. A. Nasby and others have organized the Bode, Heat, Light & Power Company, at Bode, Iowa, to establish a public service plant. The initial installation will be an acetylene plant, for which the contract has already been placed.

It is reported on what appears to be authentic information that the Ideal Irrigation Rotary Pump Company will build a manufacturing plant in Omaha, Neb. The company's headquarters are now at Seattle, Wash., where offices are maintained in the Henry Building.

The expenditure of $20,000 for the city pumping system has been authorized at Superior, Neb.

Work is about to start on the construction of the new plant of the Nebraska Portland Cement Company, Superior, Neb.

Parham & Harris, St. Anthony, Idaho, have taken the contract for nine steel and concrete highway bridges to be erected in the vicinity of Idaho Falls, Idaho.

The new electrochemical ore reduction plant of the Western Metals Company, Georgetown, Colo., which is being completely equipped with machinery especially designed for it by the General Electric Company, Schenectady, N. Y., will probably be ready to operate about December 15. Some additional auxiliary apparatus is likely to be needed during the winter.

The Walker Sheet Metal Company, Council Bluffs, Iowa, is erecting a new factory for the manufacture of sheet metal goods of all kinds. The company is in the market for steel cornice brake, gap shears and a gasoline engine and miscellaneous tinners' tools.

The First Implement & Automobile Company, Vinton, Iowa, is erecting a new factory building 50 x 100 ft., one story. Details of equipment to be purchased have not been decided upon, but the company advises it will need a heating plant.

The town of Corydon, Iowa, water and sewer bond issue of $45,000 has been placed.

A five-story flour mill, a large elevator, warehouse, &c., belonging to the estate of John Siebel, Oskaloosa, Ia., were destroyed by fire October 10, due to spontaneous combustion. The loss is over $50,000.

The recently completed electric light plant at Allerton, Iowa, was totally destroyed by fire October 6, with a loss estimated at $8000.

The Woodruff-Kray Company, Davenport, Iowa, will invest $5000 of its capital in Arkansas, to establish a new stove factory. Charles Deman of Marked Tree, Ark., is to be the agent of the company in Arkansas.

The plant of the Sterling Box Mfg. Company, located at East Fourth and Vine streets, Des Moines, Iowa, has been purchased by the Iowa Box & Lumber Company. The new owners of the plant were recently incorporated, and will continue the operation of the factory.

The Des Moines Saw Mill Company, Des Moines, Iowa, has been incorporated by Grover C. Hubbell, D. D. Langton and Verne Clark. The company will erect a building at West Ninth and Vine streets and install it with machinery, giving the plant a capacity of 6,000,000 ft. of lumber annually. Wood for furniture and fixtures and egg-packing boxes will be turned out.

The gas manufacturing department of the Tremont, Neb., Gas & Electric Light Company, was gutted by fire October 8. The loss was $1000, covered by insurance.

## North Pacific Coast

PORTLAND, ORE., October 14, 1910.

The requirements of hydroelectric power developments, both for construction work and plant equipment, are again becoming prominent in the machinery market of this territory, owing to the number of plants that have recently been brought to the stage of progress in which one or the other is needed. In quite a few instances the purchase of water turbines, governors, generators and exciter units, &c., will be required before the new year. Eastern manufacturers have some of their best men on the ground, and the engineering details are being very carefully worked out. The closing of the larger contracts will, however, take place mainly in Chicago, New York, Boston or Montreal, where the groups of capital principally interested are centered.

In the line of general industrial buying the situation shows no essential change from what has been reported during the past two or three weeks. Metal working plants continue to do a good business, and the prospects for the coming month are most encouraging.

The work of enlarging the shops of the Oregon Railroad & Navigation Company at La Grande, Ore., is to begin this month, the construction contract having already been let.

Some additional power machinery may be required before spring by the Eastern Oregon Light & Power Company, La Grande, Ore., in consequence of a decision to build an extension of the traction lines under its control. This company represents a consolidation of a number of public service corporations in that vicinity.

An electric power and lighting plant to be operated by the municipality is among the possibilities at Spokane, Wash., where the matter is under consideration by the authorities.

The plant of the Carman Mfg. Company, Tacoma, recently suffered loss from fire, but it did not affect any of the operating departments and there is no equipment that will need to be replaced.

The Standard Iron & Wire Works, Seattle, is having a good run of business this fall in ornamental work for mercantile and other business buildings.

At a meeting recently held in Spokane, Wash., the Constitution Mining & Milling Company was organized to operate the Constitution mine at Kellogg, Idaho. Henry S. Gilbert of that place is one of the principal incorporators and may be addressed for information as to any new machinery needed.

The Washington Steel & Bolt Company, Edmonds,

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Wash., is preparing to extend its plant and install additional equipment, none of which appears to have been as yet contracted for. It is stated that orders now on hand require operating the plant with full shifts both day and night. The past year has shown an extremely large increase in business and much more can readily be obtained when the enlarged facilities are available.

D. E. Fryer & Co., Seattle, are the agents in this territory for the Kinnear rolling steel doors, which are coming largely into use in industrial plants as a means of fire protection.

A shop building, 40 x 45 ft., will be completed this fall by the Western Mill Company, Seattle. Practically all of the equipment needed has been provided for.

M. H. Lynch and D. E. Servis are reported to have organized at Elma, Wash., the Olympic Railway & Power Company, one of the objects of which will be to establish a central power station to supply electric current to manufacturing plants in the vicinity.

Contracts are now being let for the structural iron and steel work of a large new general storage plant to be built in Seattle by the West Coast Heating Company.

The Olympic Foundry Company, Seattle, has thus far this season maintained a heavy output of iron castings, and the prospects for business during the next few months are very good.

Work on the new steam heating plant of the Eugene Heating & Power Company, Eugene, Ore., which was temporarily halted by a difference with the contractor, is being resumed, and arrangements for the installation of boilers will be made shortly.

The new machine shop now being built in Seattle by the Puget Sound Machinery Depot will be equipped with a very complete line of modern tools, motor-driven, and served throughout its length by a large traveling crane.

An electric power and lighting plant will be purchased for the new eight-story steel frame building which Frank McDermott is to erect in Seattle at the corner of Second and Pike streets.

It is reported from Victoria, B. C., that the Complex Ore Reduction Company of that place will build a zinc smelter at Nelson, B. C.

Watson Bros., Victoria, B. C., are building a steamer for the Alaskan trade which will be propelled by a large gasoline engine.

The Chehalis Fire Door Company, Chehalis, Wash., is erecting a new plant at McCleary, Wash., to be operated in connection with the Henry McCleary Timber Company, from the mills of which the company secures its entire lumber supply. It is the intention of the company to move the machinery and equipment which it now has in operation at its plant in Chehalis and make such additions as are necessary to practically double its present output of 1000 doors per day. The company will also erect a new warehouse, 125 x 450 ft., which will be built alongside and attached to the factory building. All machinery will be operated by direct connected electric motors.

## Interior Canada

WINNIPEG, October 15, 1910.

The men behind the recently organized Western Steel & Iron Company, Ltd., are Charles Baskerville, merchant; D. R. Dingwall, wholesale jeweler; Alexander Simmers, agent; C. P. Banning, physician, and others, all of Winnipeg, and this city will be the headquarters of the concern.

In the awful fire that has raged in the Rainy River district the lumber mill of the Rat Portage Lumber Company, Ltd., at Rainy River, said to be the largest plant of its kind in Canada, was burned to the ground. The loss to the mill and the lumber and timber in the vicinity has been enormous. The company is a very strong one and it is likely that steps will be taken at once to erect a new plant, and much new machinery will be required. Several smaller mills on the United States side of the river were also burned, and as it is about the best timber centre in the interior of the Continent it is certain that several new mills will be erected in the near future to replace the mills destroyed. D. C. Cameron, of Winnipeg, is the president of the Rat Portage Lumber Company, Ltd.

It is said that the Big River Lumber Company, Ltd., at Big River, Saskatchewan, will use even more logging machinery than the Prince Albert Lumber Company, Ltd., which has about the largest mill in that province. The plant of the Big River Company was finished just recently, and various articles of machinery are still being installed.

The Canadian Northern Railway will erect a 30-stall round house in St. Boniface, Manitoba.

The Walsh Sash & Door Company, New Westminster, B. C., is planning the erection of a new factory, with a capacity of 1000 doors per day.

The Hallman & Penniston Machinery Company, Vancouver, B. C., has supplied the boiler, saw carriage and edger for the Bailey Lumber Company's new mill at Port Hammond, B. C.

## Government Purchases

WASHINGTON, D. C., October 18, 1910.

The Paymaster-General, Navy Department, Washington, D. C., will open bids October 25 under schedule 2969, class 51, for one high speed friction saw.

Bids will be opened October 25 at the office of the Constructing Quartermaster, War Department, New London, Conn., for the construction of a pumping station at Fort Terry, N. Y., including buildings, pumps, gasoline engine, well connections, &c.

The Isthmian Canal Commission, Washington, D. C., circular 608, calls for bids, to be opened October 27, for furnishing the following supplies:

Class 3.—One washer cutting machine.
Class 4.—One portable grinder and six extra wheels.

Bids were opened September 21 by the Inspector of the Second Lighthouse District, Boston, Mass., for installing oil engines and air compressors on light vessels Nos. 3 and 4, as follows:

Richard T. Green Company, $3400 each; Bertelsen & Peterson Engineering Company, $3650 each; Fore River Shipbuilding Company, $4200; Lockwood Mfg. Company, $5645 each.

The Isthmian Canal Commission, Washington, opened bids October 10, under Canal circular 608A, for furnishing belt conveyors and boring machines, as follows:

Class 1.—Two troughing belt conveyors, 36 in.—Bidder 4, Jeffrey Mfg. Company, Columbus, Ohio, $2990; 5, Link-Belt Company, Nicetown, Philadelphia, Pa., $4540; 6, Manning, Maxwell & Moore, New York, $3639.30; 7, Motley, Green & Co., New York, $3725.84; 8, Robins Conveyor Belt Company, New York, $4276; 9, Weller Mfg. Company, Chicago, Ill., $3800.

Bids were opened October 11 at the Bureau of Supplies and Accounts, Navy Department, Washington, as follows:

Class 1.—One motor driven blower—Bidder 63, Harron, Rickark & McCone, San Francisco, Cal., $1210; 97, Manning, Maxwell & Moore, New York, $1737; 49, R. W. Geldert, New York, $1224; 112, P. H. & F. M. Roots Company, New York, $1224; 122, B. F. Sturtevant Company, Hyde Park, Mass., $1500.

Class 61.—One flat turret lathe—Bidder 70, Jones & Lamson Machine Company, Springfield, Vt., $1536; 101, Niles-Bement-Pond Company, New York, $2938; 143, Warner & Swaysey Company, Cleveland, Ohio, $1200.

Class 62.—One flat turret lathe—Bidder 70, Jones & Lamson Machine Company, Springfield, Vt., $1725; 101, Niles-Bement-Pond Company, New York, $2747; 143, Warner & Swaysey Company, Cleveland, Ohio, $1885.

Class 63.—Three geared head lathes—Bidder 42, Fairbanks Company, Washington, D. C., $768, $785, $802 and $840; 51, Garvin Machine Company, New York, $770, $785 and $810; 67, Hendey Machine Company, Torrington, Conn., $960; 77, P. J. Kemp, Baltimore, Md., $859 and $587; 97, Manning, Maxwell & Moore, New York, $960; 101, Niles-Bement-Pond Company, New York, $810; 125, Springfield Machine Tool Company, Springfield, Ohio, $793 and $819.

Class 64.—One No. 2 wire feed screw machine—Bidder 5, Brown & Sharpe Mfg. Company, Providence, R. I., $582.13; 42, Fairbanks Company, Washington, D. C., $490 and $425; 77, P. J. Kemp, Baltimore, Md., $441.50 and $516.50.

Class 71.—One combination turret lathe—Bidder 70, Jones & Lamson Machine Company, Springfield, Vt., $1950; 109, Pratt & Whitney Company, Hartford, Conn., $2578.

Class 81.—One motor driven engine lathe—Bidder 67, Hendey Machine Company, Torrington, Conn., $1083; 77, P. J. Kemp, Baltimore, Md., $780; 109, Pratt & Whitney Company, Hartford, Conn., $1339.

Class 91.—Two stoker steam engines—Bidder 46, G. & W. Mfg. Company, New York, $293; 54, Griscom-Spencer Company, New York, $283 and $125; 97, Manning, Maxwell & Moore, New York, $297; 122, B. F. Sturtevant Company, Hyde Park, Mass., $300.

Class 101.—One sensitive drill press—Bidder 77, P. J. Kemp, Baltimore, Md., $174.75 and $189.75; 97, Manning, Maxwell & Moore, New York, $350.

The Treasury Department has issued regulations allowing the usual drawback of duty on the exportation of Weston direct chain hoists, capacity ¼, ½, 1, 1½, 2, and 3 tons each; Weston geared hoists, capacity 2, 3, 4, 5, 6, 8, 10, and 12 tons each; hoist chains; and tire chains, manufactured by Clinton H. Hobbs, Boston, Mass., from imported materials. In liquidation, the regulations provide that the quantities of imported materials which may be taken as the bases for allowance of drawback may equal the quantities used as declared in the drawback entry after official verification of exported quantities, provided they shall not exceed the quantities shown in the sworn abstract. In the case of tire chains a wastage allowance shall be made not to exceed 12 per cent. of the quantity of imported chain appearing therein. No wastage shall be allowed in connection with the other articles.

# Canada's Electrical Developments

## Ontario's Cheap Hydro-Electric Power from Niagara

TORONTO, October 14.—In a recent issue of *The Iron Age* mention was made of the fact that Berlin, Ont., had received from the falls of Niagara the first current over the transmission line of the Hydro-Electric Power Commission. On Tuesday of this week the turning on of the power in that town was celebrated. Sir James Whitney, Premier of the Province, assisted by Adam Beck, chairman of the commission, inaugurates the new service. Berlin being the first municipality to be actually supplied with power under the Government scheme, the occasion was one that called forth more than local enthusiasm. Special trains ran from Toronto and large numbers of people gathered from other towns and cities. There was a half-holiday in the town, the streets presented a gay appearance, several bands played, and 10,000 people assembled at the ceremonies. At night there was a monster banquet, to which 500 persons representing the Government and the several municipalities in the power union were invited. All the dishes at the banquet were cooked by electricity transmitted from Niagara Falls. Speeches were made by the Premier and by the chairman of the commission, who reviewed the history of the Government's power policy, the marking out thereof, and the numerous difficulties overcome. The people were asked to rejoice that they were no longer dependent on foreign coal.

Hardly less than an industrial revolution will be wrought if the power scheme answers to the Government's expectations, and if the prospects it now presents to most minds are realized. The rates the commission has been quoting to municipalities are far below those at which power can be generated in separate factories. The changing from steam plants to electrical equipment would seem to be a sure and great economy. Berlin is a factory town. The municipality has for some time owned and operated a power and lighting plant, coal being used for the production of power. Its experience with this undertaking has not been satisfactory, but now that electricity from Niagara Falls is to be supplied at a much lower cost, the expenses will be greatly reduced and customers will get the benefit of the reduction.

### The Transmission Lines

The transmission system is not yet quite finished, though it is being rapidly brought to competition. It now reaches most of the towns and cities in the circuit, and is likely to be at all of them before they are respectively quite ready to receive power, the building of their internal distributing plants seeming to go on less rapidly than the construction of the transmission system. At the power house at Niagara Falls the power is received directly from the dynamos of the Ontario Power Company, which has the contract to supply the Hydro-Electric Commission. Under its contract with the commission the company is to be prepared to supply not less than 8000 hp. and not more than 100,000 hp., the price to be $9.40 per horsepower delivered at Niagara Falls, unless the total quantity taken is more than 25,000 hp., when the price is to be $9. The agreement is for a 10-year period, and contains provisions for its renewal, if desired by the commission, for two subsequent 10-year periods. Delivered at the Niagara Falls power house of the commission, the power is to have a tension of 2300 volts. There it is stepped up and transmitted at 120,000 volts. This is the highest voltage at which electricity is anywhere transmitted over so extensive an area.

The contract for building the transmission system from Niagara Falls was given by the commission to the McGuigan Construction Company in November, 1908. The work, now nearly completed, is to cost $1,270,000 for the 298 miles extended over. Two-thirds of the towers are in place. Besides the cost of constructing the transmission lines, $1,200,000 had to be expended on the step-up station at Niagara Falls, the controlling station at Dundas, and the transformers and interswitching stations at other points. This work is also near completion. Further, $400,000 had to be paid for right of way, $150,000 for the building of distributing lines and $160,000 for insulators, &c. The total outlay necessary to bring the commission's plant into existence is $3,300,000, the estimate being $200,000 more than that. About 1000 miles of aluminum wire is used.

Nearly everything used in the system was produced in Canada, Canadian works, or Canadian branches of American works getting the contracts for material and equipment. A double circuit line runs from the step-up station at Niagara Falls to Dundas, where the central distributing station stands. From there the system branches in three directions—one line running northeast to Toronto; one running directly west through Woodstock to London; the third running northwestward to Guelph, and thence westward and south to meet the second branch at London. From London the system proceeds to St. Thomas, and is to be extended to Windsor, whence power is to be cabled across to Detroit. The line has a safety relay switch system that is in use nowhere else.

### A Co-operative Municipalities' Undertaking

This public power policy rests on the co-operative principle, the parties co-operating being not individuals or private corporations, but municipalities, some of which are cities, some towns and others villages. The province, through the agency of the Hydro-Electric Power Commission, simply manages the business for the municipal group concerned, and makes the financial arrangements, which arrangements involve the pledging of the provincial credit for the bonds issued. The rates charged by the commission are calculated to cover the whole outlay on purchase, operating and maintenance account and provide for the charges on account of interest and sinking fund, the latter charges holding for 30 years, when the bonds mature and are paid off and the plant becomes the unencumbered property of the partnership of municipalities. The larger the number of municipalities associated together as takers of power from the commission throughout the area of the transmission system, the lower will be the price of power. Windsor's recent inclusion with a demand swollen in Detroit's behalf lowers the rate for all the parties.

Twenty-one municipalities have signed contracts to take power under this arrangement. Besides the 21 now in the scheme, 19 other municipalities traversed by the lines have voted in favor of joining, and all that remains is action by their respective municipal councils. It is expected that the number of municipalities embraced will be materially increased by the time the system is working throughout its present membership. It is also predicted with confidence that their present collective demand for power will be multiplied in a very few years.

One early result of cheap power in that populous and productive region of the richest province in Canada will be a marked increase in the electric railway mileage, interurban as well as intraurban. A very great development of industries is looked for. The system favors the growth of business and towns from small industrial beginnings, as power will be supplied to municipalities and customers in large or extremely small amounts. Thus, places where the largest demand that could be mustered would be too small to induce private enterprise to go into the power business will be able to supply themselves cheaply with

as little as they want, and the small manufacturers among whom that little is distributed will have a chance to build up gradually.

### A Regenerator of Industry

The interest of manufacturers in the Government's power policy has grown because their faith has grown with the progress of the scheme toward full realization. That hydro-electric power can be supplied to Toronto manufacturers at not more than half the present cost appears to be all but a proud fact. The estimate of the commissioner's engineer is received with less reserve view that it is seen that the transmission plant can be finished for less than the amount set down for it. Manufacturers who would not promise to throw out their engines and metal motors will not be backward in making such changes when the time comes to renew worn out motive plant. Many will see their way to making the change as soon as the municipal distribution system is ready to supply them from the hydro-electric commissioner's delivery and for motor installation and electrical equipment on manufacturing plant account the demand is expected to become active throughout the region covered by the public transmission system. Manufacturers in Ontario find the present charges on power account unduly heavy.

The coal used for the production of power is all imported. The only run of the mine on bituminous coal is 53 cents per ton under the general tariff, and it is only under the general tariff that any can be imported, as British coal, to which the preferential duty of 53 cents a ton would apply, cannot be brought to Ontario. If it could, surely Nova Scotia coal could, and Nova Scotia coal is never seen in this Province. Bituminous stock coal that will pass through a three-quarter screen is admitted from the United States at 14 cents a ton, but it has limited usefulness in industry. Ontario manufacturers do not relish the idea of paying 53 cents a ton on so necessary an import as coal, when they perceive that their doing so does not enable or induce Canadian coal producers to supply the Ontario market. The riciprocity negotiations now about to be entered upon may result in the removal of the coal duty. But even with that import off the Canadian manufacturer would not be able to make power from coal nearly so cheaply as he can get it from the Hydro-Electric Commission.

At the Berlin celebration there were many exhibits of electrical machinery and supplies made by the principal Ontario manufacturers of such articles.

C. A. C. J.

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The new wire rod mill of the Jones & Laughlin Steel Company, at Aliquippa, Pa., is equipped with 16 sets of 9, 10 and 12 in. rolls, and has an annual capacity of about 100,000 gross tons of wire rods. The wire drawing department of the plant has 104 wire drawing blocks, draws wire from 7-16 in. to No. 20 gauge inclusive, and can make about 60,000 tons of wire annually. The wire nail department has 110 machines, and can make about 600,000 kegs of nails annually. The wire rod department was started in August, and the wire drawing and wire nail departments are to begin operations about November 15.

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Officials of the Clark Steel Car Company, Pittsburgh, have been in communication with Youngstown, Ohio, builders with a view of building a steel car plant at that place. It is stated the concern desires a location convenient to steel plants, from whom a supply of steel can be secured.

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The Pittsburgh Malleable Iron Company, Pittsburgh, has declared a quarterly dividend of 2½ per cent.

# Air Supply for Foundry Cupolas

## Blast Pressure, Thickness of Coke Bed, Tuyere Area and Other Factors

In *Stahl und Eisen*, Nos. 9, 14 and 17, 1910, installments appear of a long article on the air supply necessary for melting with the cupola. It is by George Buzek of Trzynietz. He begins by saying that the object of blowing air into the cupola in ordinary melting practice is to promote as complete and rapid a consumption of the coke as possible, thereby attaining a violent development of heat, and in consequence rapidly melting and strongly overheating the molten metal. From the theoretical figures on the heat development of carbon when burned to either carbonic acid or carbonic oxide, we note that when compared with the maximum effect when all the carbon goes to carbonic acid, a mixture of half and half of the two gases has already lost 35 per cent. of the heating value of the fuel. If all is carbonic oxide the loss from the theoretical will be 70 per cent. Hence the necessity of obtaining a more or less perfect combustion in the cupola, of watching the cross section in the melting zone, the blast and the coke conditions.

### Is CO or $CO_2$ Formed First?

There are two theories in regard to the combustion of coke in a cupola: 1, That the carbon is turned at once to carbonic oxide, and this combining with more free oxygen makes more or less carbonic acid; 2, that the carbon is at once converted to carbonic acid and then by subsequent solution of more carbon becomes carbonic oxide. The latter is the more generally accepted. The first theory is based upon the observation that only in the case of an ideal contact of oxygen and carbon is it possible to get carbonic acid, and this is only possible when the fuel is in the form of a gas. Again, as the specific gravity of carbon in the solid state is 5000 times as great as that of oxygen, there can be no pretense of an intimate mixture or contact, as is necessary to form the carbonic acid in question. This gas, by the way, is supposed to be unstable at high temperatures.

Experiments made by Beckerts in this direction have shown that the maximum of carbonic acid is contained in the products of combustion when they are between 950 and 1300 degrees F. As the temperature rises the carbonic acid percentage recedes until at 1800 degrees it is *nil*. Since the temperature before the tuyeres is higher than this, it might be argued that carbonic oxide is formed at once.

In regard to the more generally accepted theory of a carbonic acid formation at first, it may be said that all experiments along this line have been made with the producer rather than the cupola. Thus, in a publication by Schoemann analyses are given of gases taken from different hights of a producer, which show that at the blast entrance the percentage of carbonic acid was 15, the CO 9.7, and the N 75. 3. At 10 in. above this point the figures ran 0.2, 34.1 and 65.7, and the temperature was 2550 degrees F. As the hight rises the relation remains practically constant, but the temperature drops slowly. These results would indicate that the carbonic acid disappears quite rapidly in the process of gas making.

### Blast Pressure and Coke Bed

Now, whichever of these theories is correct, the fact remains that in cupola practice a maximum of carbonic acid and minimum of carbonic oxide is desirable; in fact, necessary. Hence it should be the aim of the operator to work accordingly. If we recollect the thin bed of coke in the zone of combustion and the speed of the gases passing through it, we will find them to take only 1-40 sec. doing this, with all the molecular

changes to operate and in a very confined space at that. In former times, when cupolas were operated like blast furnaces—with high blast pressures and heavy coke burdens—the melting was slow and only carbonic oxide was produced. Increasing the quantity of air and reducing the pressure corrected this trouble, particularly when the proper ratio of cupola cross section with air quantity was struck. To get this the author wants only so much air blown in as will burn the coke at the tuyeres and convert any carbonic oxide just above them to carbonic acid. If more air is used the melting zone goes up; if less, then the cupola will run cold independent of the amount of coke charged. The author takes the position that for each cupola a given time requires a given amount of air constantly, independent of the size of the coke bed. He admits, however, after an elaborate calculation, that the rate of melting is dependent upon the thickness of the bed at all times.

Taking the cases where either more or less than the right amount of air is used, we have in the former a consumption of just so much oxygen as will burn up the coke properly, and the excess will be found in the cupola gases passing off. The speed of the air is such that all the carbonic oxide is burned to carbonic acid, and no time is left for the carbonic acid to take up more carbon, and hence the highest temperature probable, and good melting is done.

If too little air is used incomplete combustion takes place, air and coke being in contact too long. Carbonic oxide is formed and a cold run is the consequence. Hence the advisability of a good excess of air over the requirements. If it were possible to cool the gases suddenly just above the melting zone they would show a greater freedom from carbonic oxide. This may be done as a half-way measure by putting in heavy iron charges and letting these run as low as may be dared without burning the iron. This has its disadvantages, and hence the introduction of a second row of tuyeres to burn up any carbonic oxide that has passed up above the bed. Unfortunately an injudicious use of this second row means the formation of another melting zone, with a lot of other difficulties. The author therefore condemns upper tuyeres, holding that all advantages coming from increased melting rates thereby are merely the result of extra amounts of air introduced and not through the burning of any carbonic oxide.

### Hight of the Charging Door

In regard to the size of the tuyeres the author holds that for small cupolas one-eighteenth of the cross section is proper, and for large ones half of this is sufficient. When there is danger of rapid bunging up, the tuyere area can be made as large as 20 to 50 per cent. of the cross section. The hight of the cupola from spout to charging door is regarded as a function of the diameter. In fact, the hight should really be taken from the melting zone to the charging door to be more correct. Coke is a poor conductor of heat, but iron a good one. The temperature of the gases leaving the coke bed depends upon the hight of the latter. Hence if a low melting ratio is used so much coke fills the cupola that the metal charged cannot take off all the surplus heat it should. Therefore, a high cupola in this case. If, on the other hand, a high melting ratio is used, the cupola can be lower, as the iron charged is larger in surface for absorption of the heat in comparison with the coke charged. If the coke bed is too thick the temperature of the gases going up will be lower than if this is just right. Charging with long pigs requires a higher cupola than with broken pigs on account of the readier heat absorption of the latter.

Again, the longer the cupola is run the higher the temperature of the interior, and hence for continuous melting the hight of the cupola should be greater than for short heats. The author states that the only way, in his estimation, to charge the cupola correctly, is to keep a constant thickness for the intervening coke layers for any given cupola, and to vary the iron charges accordingly as hot or cold iron is wanted. The present way is to vary the coke and fix the iron charge.

## Trade Publications

**Runabout.**—Metz Company, Waltham, Mass. Folder. Concerned with the 1911 Metz runabout. This car is offered as economical, low priced and practical, and easily handled in city streets. Illustrations and brief specifications are included.

**Gear Shields.**—The Ironsides Company, Columbus, Ohio. Circular. Concerned with the Ironsides gear shield for electric railroad use. Tests made on a number of these shields when in use are given and a drawing shows the condition of the gear after running 24 miles with an Ironsides gear shield as a lubricant retainer.

**Pneumatic Riveters.**—The Hanna Engineering Works, 2059 Elston avenue, Chicago, Ill. Instruction book for repair men and operators of the Hanna pneumatic compression riveters. The text covers practically all the points likely to arise during the erection, operation and repairing of this tool, and numerous illustrations are used to supplement the text. Two pages of general information on the subject of riveting complete the book.

**Die-Cast Finished Parts.**—H. H. Franklin Mfg. Company, Syracuse, N. Y. Booklet. Refers to the use of Franklin die castings as a substitute for machine finished pieces. In the production of these parts molten composition metals are forced into steel molds under high pressure and the metal quickly cooled, after which the finished casting is removed. This process has already been applied to the production of automobile bearings and parts, and the illustrations give an idea of the wide range of work for which it has been used. Among the parts shown are those for census tabulating machines, a newspaper vending machine, gears, segments used in computing machines, parts for soda fountain pumps and a variety of castings for telephone and other electrical work. Different points to be noted by designers of parts to be made in this way, and specifications for the various standard Franklin metals are included.

**Automatic Screw Machines.**—National Sewing Machine Company, Belvidere, Ill Catalogue. Size 9 x 12 in.; pages 24. Lists the various styles of National automatic screw machines for forming, drilling and reaming parts from rods of steel or brass automatically. A general description of the machines is given, followed by illustrations and brief specifications of the various machines. *The Iron Age*, May 26, 1910, contained an illustrated description of the No. 3 plain automatic National screw machine. Space is also given to illustrating a hand shaving machine, the tools used on the automatic machines and some of its products.

**Motor Trucks.**—The American Locomotive Company, 1886 Broadway, New York City. The 1911 motor truck book. Pertains to the Alco truck, for which great economy is claimed. The different parts of the truck are illustrated and described, and a number of views show the truck in use transporting various materials. Figures of the performance of these trucks in actual service are given. One of the trucks hauling iron pipe and fittings exclusively in 52 days traveled 1675 miles and consumed 379 gal. of fuel, while the other, which was in express service around New York City, consumed 268 gal. in covering 1180.9 miles. Brief specifications of the truck complete the book.

**Lifting Magnets and Controllers.**—The Electric Controller & Mfg. Company, Cleveland, Ohio. Pamphlet and circular. The former contains facts about lifting magnets and shows how a saving in money is effected. The special features of these magnets, such as wide separation of terminals, permanence of insulation and the use of heat radiating ribs on top of the magnet case, are described and the text supplemented by illustrations. The folder describes the Dinkey ventilated controller made for both alternating and direct current circuits in steel mills. The controller is illustrated and its special features are pointed out in the text surrounding the engraving. *The Iron Age*, June 2, 1910, contained an illustrated description of this controller.

**Conveyor Belts.**—John J. Ridgway, P. O. Box 1855, New York City. Booklet, entitled "How to Buy Conveyor Belts." Describes the points to be considered, the three primary ones being the fabric from which the belt is made, the friction adhesion and the surface covering. These various points are discussed at length and the advantages possessed by the Hinge Edge belts brought out.

**Pipe Couplings.**—Grip Coupling Company, Morse avenue, Ware, Mass. Circular. Shows the Grip couplings for connecting pipes without threading. These are designed for pipes carrying steam, water, gas, air and chemicals, and are tested to 2400 lb. per square inch. Three special advantages claimed are that they do away with ground joint unions, pipe wrenches and thread-

cutting tools, reduce the amount of labor required by two-thirds and preserve the entire tensile strength of the pipe jointed.

**Gasoline Traction Engines.**—Buffalo Pitts Company, Buffalo, N. Y. Pamphlet. Describes and illustrates the company's 1911 model Triplex gas traction engine, which has been designed primarily as a tractor for hauling and plowing, but is also equipped with a pulley for driving machinery. In order that the engine can recover speed quickly if the speed is lowered by temporary excess load or other cause, short stroke motors and a multiplicity of cylinders are used, giving at normal speed 720 impulses per minute. Various views of the engine are given, supplemented by a detailed description.

**Foundry Chaplets.**—The Archibald M. Hall Company, 224 West Maryland street, Indianapolis, Ind. Folder. Deals with different sizes of wrought iron chaplets and chaplet stems. A list of the various sizes made of each and the prices are appended.

**Machinery and Supplies.**—Lombard Iron Works & Supply Company, Augusta, Ga. Catalogue C. Size 6 x 9 in.; pages 693. Covers an extensive line of machinery and supplies for cotton, cottonseed oil and flour mills, railroads, machinists, blacksmiths, contractors, engineers, plumbers and phosphate mines. The lines included are very complete and cover engines, boilers, pipes and fittings, shafting, pulleys, leather and rubber belting, hose, mill supplies and machine tools. All of these are illustrated and tables of dimensions accompany the engravings. There is a 27-page alphabetical index which renders the finding of any desired article comparatively simple, and a number of tables of useful information complete the catalogue.

**Sheet Metal Work.**—The W. J. Clark Company, Salem, Ohio. Indexed bulletin. Lists all the various kinds of sheet metal pieces made by this company. These include elevator buckets, joist or timber hangers, post caps, bases, wall boxes, factory furniture, boxes, barrels, kegs, pails, pans, lockers, stools, shelving, benches and couplers for air, steam, gas or water hose. Articles for similar purposes are shown on the same sheet and brief descriptions and specifications supplement the engravings. In addition to the lines shown the company is prepared to execute orders for special work.

**Electric Furnace for Heating Bars and Billets.**—The Bailey Engineering Company, Alliance, Ohio. Catalogue. Size 6½ x 10 in.; pages 16. Gives general description and specifications for an electric furnace for heating forging stock, which has been designed in response to a demand for low cost electrical energy to operate these furnaces. This furnace utilizes the exhaust steam from the steam forging hammers, which is led into an exhaust steam turbine direct connected to a generator supplying the current required by the furnace. This combination is said to be admirably suited for such service, as in the average plant sufficient exhaust steam is available, which when transformed into electrical energy by the turbo generator and then into heat by the furnace will heat all the metal forged under the hammers. The construction of the furnace is described at length, and there are a number of sectional views.

**Machine Handles.**—The Cincinnati Ball Crank Company, 1249 Plum street, Cincinnati, Ohio. Booklet. Refers to a line of steel ball crank handles for machines and compound rests, straight machine handles and two ball levers. The different styles of handles are all illustrated and brief specifications of the different sizes made are given on the facing pages in tabular form.

**Steam Hammers.**—The Buffalo Foundry & Machine Company, Buffalo, N. Y. Catalogue No. 911. Calls attention to the Bell steam hammers, which are made in a number of different sizes and styles. The different models include the double frame guide type and the single frame guide type, both of which are built in all sizes, a combined type built in five sizes with falling weights ranging from 100 to 300 lb., and the open frame built in four sizes with falling weights ranging from 250 to 1500 lb. The four different types are illustrated and brief specifications give the features of the tools. The special advantages claimed for these hammers are the use of a special shock resisting metal, high grade mechanical construction and a design insuring continuous service and economical operation.

**Special Machinery and Tools.**—American Die & Tool Company, Reading, Pa. Several circulars. Refer to the various tools and pieces of special machinery built by this company, which include air drill rivet reamers for boilermakers, shipbuilders, street car builders and structural ironworkers, punches and dies of all shapes and sizes, the Weiland supplementary carbureter, automobile transmission gears, a metal saw cutting-off machine and a surface die grinder and grinder head combined with plain table. The carbureter is a device that can be attached to any float feed model as a permanent fixture and when properly adjusted is said to require no further attention. Two of its special features are making the old carbureter self-priming and starting the cold motor in freezing weather on the first complete cycle.

**Steam Boiler Specialties.**—A. W. Cadman Mfg. Company, Pittsburgh, Pa. Catalogue No. 10. Refers to a number of boiler specialties, which include blow-off valves, gauge cocks, slit plug valves and check valves. All of these specialties are illustrated and described and tables giving the various sizes are appended.

# The German Iron Market

BERLIN, October 6, 1910.

The market shows further improvement. The trading on the Düsseldorf Exchange on Friday was marked by a firm tendency for pig iron. The advances in prices, corresponding with the new scale adopted by the syndicate, were unusually large. Steelmaking qualities were quoted at 62 to 63 marks, against 59 to 60 previously; German Bessemer, 70 marks, against 62 to 63; German foundry, No. 1, 66 marks, against 65. On the other hand, English hematite fell from 85 to 86 marks to 84 to 86 marks under the influence of market conditions across the Channel. From Belgium, too, the weakness previously reported continues. A dispatch of to-day's date from Brussels states that the export price of basic bars at Antwerp has just dropped 1 to 2 shillings the ton, making the minimum price 96 shillings, f.o.b. Bar iron and heavy plates also dropped 1 shilling, the former to 97 and the latter to 108 shillings.

The German market is regarded as in a good position. The inland demand is visibly increasing. The imports of pig iron from England showed a considerable gain last month, notwithstanding the fact that the German furnaces are turning out more iron than ever before. Ore prices, both home and foreign, remain firm. The long interruption of ore production at Bilbao through recent labor troubles, carried Spanish ore prices to a high level; since the resumption of work a slight reaction has ensued, but the price is still as high as 20½ to 21 marks for 50 per cent. hematite ores delivered at Ruhrort. Considerable quantities of Mediterranean ores were bought in place of Spanish during the strike at Bilbao.

### The Steel Trade More Active

Business in steel for further manufacture has grown more active. Consumers are calling for shipments on contracts at a brisk rate; and the impression created is that the manufacturers of finished products are better employed than hitherto. Bars are also more active. Dealers have abandoned their waiting policy and are now buying much more freely. The export trade in bars is somewhat quieter, but manufacturers have succeeded in holding their prices for export at 100 to 102 marks. Bar iron is going off briskly; the foreign business is done at prices nearly equal to the home prices. Considerable work in band iron has come in, and the mills are well employed. There is also a very active trade in cold rolled bands, the price for which has been raised to 202.50 marks. Business in skelp for making steel tubing is quite active, the manufacturers of the latter having placed orders for supplies to the end of the year. The shipbuilders' lockout has very little effect upon the heavy plate trade. Happily the labor difficulty was settled to-day, and henceforth ship plates will be called for delivery at a hurried pace; the orders in hand are heavy. Wire rods have become more active, both home and foreign buying being in larger amounts. The Wire Association has just declared business open for the first quarter of 1911 at unchanged prices. Drawn wire and nail-making qualities are quoted at 14.75 to 15.25 marks per metric hundredweight, and wire nails at 16.25 to 16.75 marks.

The rail market has hardly changed. Foreign orders, however, have been scarcer for a week. Street rails are in fair demand. Heavy rails for export cost 105 to 110 marks on shipboard. Light rails for mines and temporary tramways are quoted at 115 to 120 marks for the inland market and grooved rails at 140 to 145 marks. Steel castings are in very heavy demand. In the hardware trade improvement continues in some branches.

# Iron and Industrial Stocks

NEW YORK, October 19, 1910.

The stock market has continued its upward course, heavy advances having been made in quite a number of stocks, especially United States Steel and International Harvester. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

| | | | | | |
|---|---|---|---|---|---|
| Allis-Chalm., com.. | 10 | - 11 | Pressed St., pref... | 96½ | - 97 |
| Allis-Chalm., pref.. | 33½ | - 35⅛ | Railway Spr., com. | 34½ | - 38½ |
| Beth. Steel, com.. | 28 | - 30½ | Railway Spr., pref..... | 93¾ | |
| Beth. Steel, pref.. | 58¾ | - 60¾ | Republic, com..... | 33 | - 34⅞ |
| Can. com..... | 8¾ | - 9½ | Republic, pref..... | 95 | - 97 |
| Can. pref..... | 70 | - 71 | Sloss, com..... | 54 | - 57 |
| Car & Fdry, com.. | 50½ | - 55⅝ | Pipe, com..... | 16 | - 17½ |
| Car & Fdry, pref.. | 115½ | -116¼ | Pipe, pref..... | 56 | - 60 |
| Steel Foundries.... | 44 | - 48 | U. S. Steel, com... | 71⅝ | - 77¾ |
| Colorado Fuel..... | 34½ | - 36¼ | U. S. Steel, pref... | 118⅝ | -120⅛ |
| General Electric... | 152½ | -155½ | Westinghouse Elec. | 71½ | - 73 |
| Gr. N. ore cert.... | 57⅜ | - 60¼ | Am. Ship, com..... | 79 | - 79½ |
| Int. Harv., com.... | 103 | -111⅝ | Am. Ship, pref.... | 108 | -108½ |
| Int. Harv., pref.... | 122 | -124 | Chi. Pneu. Tool... | 41 | -*42½ |
| Int. Pump, com... | 43 | - 45 | Cambria Steel..... | 43 | - 44½ |
| Int. Pump, pref... | 84 | - 85½ | Lake Sup. Corp.... | 24½ | - 25 |
| Locomotive, com... | 39 | - 41⅛ | Pa. Steel, pref..... | 110 | |
| Locomotive, pref..... | 105 | | Crucible St., com... | 12¾ | - 13 |
| Nat. En. & St., com..... | 17⅛ | | Crucible St., pref.. | 77½ | - 79½ |
| Nat. En. & St., pref..... | 84 | | Harb.-W. Ref., com..... | 31½ | |
| Pressed St., com... | 35 | - 36⅞ | | | |

* Ex. dividend.

# The Integrity of Tests of Metals*

## Specimens Often Not Representative of the Properties of the Material

BY ALEXANDER E. OUTERBRIDGE, JR.

There is no subject of greater interest and importance in the metallurgical arts than that of testing metals. Upon the integrity of these tests rests the stability of all the immense modern structures composed of iron, steel, bronze and other metals. Human life depends in many instances upon the reliability of tests made in the laboratories of "coupons" cut from full size sections, in some cases, or from small bars—usually cast attached to larger masses—in other cases. These coupons, or test pieces, are supposed to represent fairly the average tensile and transverse strength, the ductility or resilience (*i. e.*, ability to resist shock), the micro structure of the metal and, in a word, to reveal the true physical properties of the material entering into any given structure.

Have we arrived at a degree of perfection in the art of testing metals that enables us to rely with confidence upon such records? I fear not, and I purpose herein to give briefly a few of my reasons for this somewhat pessimistic view.

### Why Records Are Often Misleading

So far as the development of various machines for accurately testing the tensile strength, transverse strength, torsional strains, &c., of metals, is concerned, a very high degree of sensitiveness combined with accuracy has been arrived at by many constructors of such apparatus; but if the specimens tested do not in all cases fairly represent the quality of the material in the mass the records may be, and often are, misleading.

My own investigations, extending over a period of nearly 40 years, have convinced me that coupons or test pieces do not always represent truly the strength, molecular structure, resilience, &c., of the material to which they may be attached and to which they are supposed to conform closely in physical properties for the following reasons among others.

Metals in their pure state are not employed in engineering constructions; all are more or less heterogenous compounds or alloys and all alloys (with perhaps the single exception of gold and copper) tend to segregate or separate in the process of cooling from the liquid to the solid condition into richer and poorer alloys, one particular combination usually forming what is known technically as the "eutectic." For example, the standard alloy of silver and copper (9 parts silver, 1 part copper) used for the silver coin of the United States Government, and of many other nations is, of course, prepared with the greatest care, and the molten metal is thoroughly stirred before it is poured into ingots. These ingots are made of the proper width and thickness to enable them to be rolled into strips from which the blanks or planchets for the coin are punched. If an assay be made from chips or filings cut from the center of a silver dollar and an assay also be made from chips cut from the periphery, they will not agree exactly; indeed, cases have been known where the variation in fineness actually exceeded the legal limit of tolerance; or allowance of variation from the standard of nine-tenths fine.

This fact was proven by exhaustive investigations, made many years ago, which resulted in the abandonment of the old method of taking test pieces by cutting chips from the ingots or from the blanks, and substituting therefor what is known as the granulation test method. After the melted alloy has been thoroughly rabbled or stirred, two or more samples of the liquid metal are dipped out from the pot and poured into ice water in order to cool them instantly in the form of granules. Under these conditions there is not time for segregation to occur, and duplicate samples taken from the top and bottom of a crucible containing perhaps 7000 to 10,000 Troy ounces of coin metal will agree in fineness within a few thousandths of 1 per cent.

In the case of the standard gold alloy for coin (9 parts gold, 1 part copper) no precautions of this kind are needed, for the simple reason that this alloy does not segregate, and chips taken from the edge and from the center of a double-eagle will conform to the legal requirements, notwithstanding that they are very much more strict than in the case of silver coin.

An experience of 12 years as an assistant in the Assay Laboratory of the United States Mint (1868-1880) made me familiar with these refinements in metallurgical methods of testing that have been of inestimable value in my after life, which has been devoted to testing commercial metals. The knowledge thus gained has been practically applied in various ways in connection with cast iron, steel and bronzes.

### Variations in Cast Iron Due to Rate of Cooling

With respect to cast iron it is no exaggeration to say that the rate of cooling of gray cast iron exerts as important an influence in determining its physical properties as does variation of its chemical constituents within, of course, certain quite wide limits. If a wedge shaped bar be cast of ordinary foundry iron, say, 6 ft. long, 6 in. wide, 6 in. thick at one end, and tapering in thickness to, say, ¼ in. thick, almost every grade of cast iron may be found in the bar by nicking and breaking it into short sections, say, 6 in. long each. At the thick end the fracture will be coarse grained or "open" with very dark color due to the fact that almost all of the carbon is in the graphitic or "free" condition. At the thin end the fracture will be fine grained and light in color because a considerable portion of the carbon will be chemically combined with the iron. If test bars be cut from these different sections, it will be observed that the coarse grained metal is very soft under the tool, while test bars cut from near the thin end will be very hard to turn. Between these two extremes the metal will have intermediate degrees of hardness and of coarse grainedness.

If tensile tests be made from different portions of the casting, it will be found that the strength varies with the structure through an enormous range, as much as 100 per cent. gain often occurring in one portion over another. If the ordinary foundry iron used for the wedge shaped casting be low in silicon (say 1 per cent. or under) the thin end of the wedge will be as white as silver, as hard as steel and as brittle as glass, because a large proportion of the carbon will then be in the combined form.

I have before me two test bars of soft foundry iron used for casting light pulleys, poured from one small hand ladle of iron into companion bars of the same size, viz., 1 x 1 x 15 in. One bar was cooled normally in the green sand mold, the other was cooled very rapidly indeed. Both bars were broken transversely on an ordinary transverse testing machine, using a span of 12 in. One bar, cooled normally, broke under a strain of 2000 lb. (round figures); the other, cooled rapidly, at 4000 lb. exactly. One-half of each bar was then used for tensile tests, being turned to the same dimensions and pulled upon a 100,000-lb. hydraulic testing machine. The bar cooled normally showed tensile strength of 21,500 lb. per square inch. The bar cooled rapidly showed tensile strength of 37,000 lb. per square inch. These particular tests were made 22 years ago, and the results have been corroborated many times since then; also valuable practical use has been made continuously from that time of the knowledge thus gained

* From the *Journal of* the Franklin Institute. The paper was prepared to be delivered as the opening address at the annual autumn session of the Mining and Metallurgical Section.

of the remarkable effect of controlling the cooling of castings of nonuniform sections.

In a paper giving some the foregoing facts, read before the American Society for Testing Materials in 1903, published in their *Proceedings*, Vol. III, page 216, the following conclusions were drawn: "The rate of cooling of cast iron from the fluid to the solid state is such an important factor in determining the physical properties of the metal, that it is just as necessary to know the dimensions of the test bars as it is to know the chemical composition. For the same reason it is equally desirable that standard sizes of test bars should be adopted, which would be suitable for different grades of iron."

It is pleasing to note that the American Society for Testing Materials, through one of its subcommittees, has been endeavoring to bring about uniformity of methods of testing, not only between different manufacturers in the United States, but also in Europe as well, with indications of a successful issue in time.

Castings of iron and other metals are frequently made for the Government as well as for private engineering firms under specifications which sometimes tax the ability of the founder to meet pretty stiff requirements as to strength. In the absence of any specific rules as to the method of molding the test bars or coupons, or even as to their size, the temptation to a foundry foreman, who may have practical knowledge of the facts here noted, to "jockey" with the test bars and thus insure that they will fully meet the requirements, is very great and ought not in the interest of all to be continued longer.

### Manipulation of Cast Iron Test Bars

There is still another method, now pretty well known, by which the transverse strength of cast iron test bars can be increased from 25 per cent., even up to nearly 50 per cent., without either rapid cooling of the metal or making any change in method of molding. Instead of simply brushing off the loose sand from the test bars with a wire scratch brush, if they be placed in a tumbling barrel, commonly employed in foundries for cleaning castings and tumbled about therein for a couple of hours, they will all gain largely in transverse strength due, it is thought, partly if not mainly, to the rapid release of cooling strains caused by shocks; and it has long been known that iron castings improve in strength with age, due to gradual release of internal strains. When these peculiar observations were first made known, the custom of cleaning the sand from test bars in the tumbling barrel became very popular, indeed, and finally a few years ago the American Society for Testing Materials found it desirable to incorporate a special clause in its new specifications for cast iron that test bars must not be tumbled or otherwise subjected to mechanical shocks or vibrations before being broken. This was a gratifying tribute to the original discovery.

On the occasion of a visit to a large manufacturing establishment some time before this restricting clause was adopted, I noticed that all of the cast iron transverse test bars had been put through the tumbling mill "to clean them," as I was informed by the boss.

### Rate of Cooling in Bronze Test Bars

With regard to test bars for bronze castings, similar restrictions should apply in regard to cooling, for segregation occurs in all commercial bronzes, depending largely upon the rate of cooling from the liquid to the solid state. This segregation changes the molecular structure and affects the tensile strength of the metals. Coupons or test pieces of bronze cooled much more rapidly than the castings to which they may be attached do not reveal the true character of the fracture, or the real strength of the metal. On the contrary, they present to the eye a finer grained, more uniform metal and show abnormal strength in the testing machine. Very recently, indeed, my attention was called to a novel application of this fact by noticing some rather high tensile tests of test bars attached to some important castings made of a special bronze. The fracture of the test pieces was exceedingly fine grained and showed an absolutely uniform or homogeneous structure. On examining very carefully some of the castings with the test bars still attached, it was plainly to be seen that they were poured under very different conditions from the castings themselves, the test bars being cast into iron molds so as to solidify them instantly, while the castings to which they were joined were made in ordinary sand molds.

Test bars thus doctored are, in my judgment, far worse than useless, since they give the purchaser of the castings, who has taken the precaution (involving some trouble and expense) of turning and testing coupons, a false record of the character of the metal in his castings.

Apropos of this, I will venture, in conclusion, to refer to my short paper, entitled "A Study of the Micro Structure of Bronzes," printed in the *Journal* of the Franklin Institute, January, 1899, in which appear a number of photomicrographs of specimens of bronze metals (90 were used in the investigation) cast in sand, and one representing a United States cent in which the crystals are very much finer and the metal is apparently more homogeneous, for there is an absence of the irregular bands of the eutectic alloy so conspicuous in all of the other bronze specimens. It was stated that "this is perhaps partly owing to the fact that coin ingots are always cast in iron molds and the metal is thus suddenly solidified while all of the other specimens were cast in sand molds. This observation may have practical value."

### The Necessity of Uniform Methods

The conclusions drawn from these investigations with bronze metals were quite similar to those already noted with respect to investigations in cast iron, and are as follows:

1. Variations in treatment of specimens cause variations in the results, which may be misleading, and it would, therefore, seem desirable that some uniform system should be adopted by all investigators in this field.

2. The rate of cooling of a mass of metal affects the micro structure so that two specimens from the same ladle of metal, one taken from a small casting quickly cooled, the other from a large casting slowly cooled; or two photomicrographs taken from different portions of the same specimen may show variations in micro structure that may lead to error.

It is desirable, therefore, that some uniform size of specimens (and uniform method of molding) should be selected by micro metallurgists as a standard with which to make comparisons.

The actual case cited here, where bronze castings were made in sand molds subject to slow cooling, while the attached coupons for testing were made in iron molds to insure rapid cooling, coming to my notice only a few days ago emphasizes the importance of some concerted action in accordance with the foregoing suggestions looking toward adoption of standard methods for testing metals, and for insuring the integrity of such tests.

Numerous other illustrations might be drawn from my own daily experience and observation, but I think enough have been given to establish a good case. It is one that I have been arguing for a number of year.

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The La Belle Iron Works, Steubenville, Ohio, now have both their blast furnaces in operation for the first time in months.

# American Electrochemical Society

## The Eighteenth General Meeting in Chicago, October 13 to 15

The eighteenth general meeting of the American Electrochemical Society, held in Chicago October 13, 14 and 15, was attended by nearly 200 members and guests. It proved to be one of the most successful meetings the association has ever held. The forenoon of each day was devoted to business sessions, and the remainder of the day to excursion trips and entertainment features. The business meetings were held in the Florentine Room of the Congress Hotel, on Thursday and Friday, but the closing session Saturday morning was held in the lecture hall of the Kent chemical laboratory at the University of Chicago. A special feature of the meeting was a banquet at the Congress Hotel Friday meeting. Large parties of the members took advantage of afternoon excursion trips to points of interest around Chicago, under guidance of Chicago members. Special excursions were also arranged for the ladies by an entertainment committee of Chicago ladies.

### Some of the Papers Presented

An interesting feature of the Thursday session was an informal address by the secretary, Prof. J. W. Richards, describing the Hiorth electric furnace which has been in successful operation in Norway.

A short paper was also presented by R. S. Wile, Riverside Metal Refining Company, Connellsville, Pa., at the same session, describing the reduction of tin dross in an electric furnace. In this furnace the dross mixed with the proper percentage of carbon is charged on top of the slag, while the tin as fast as reduced by its contact with the hot slag filters through the slag and collects in the bottom of the furnace, from which it is tapped. Papers were further presented on a method of determining thermal conductivities by Carl Hering, and notes on tribo-luminescence by W. S. Andrews.

At the Friday session an exhaustive paper by A. R. Johnson, on the electrolytic preparation of calcium, gave the results of extensive experimental work at the University of Wisconsin. Efficiency in the electrolytic production of metallic calcium was discussed in a paper by Francis C. Frary, Henry Bicknell and Carl A. Tronson.

The evolution of lead storage batteries was discussed by Pedro A. Salom, who described the various forms of batteries now on the market and reviewed interesting features in their operation and efficiency. A paper by Prof. O. W. Brown and W. G. Bowers proved of considerable interest, as it reviewed tests which have been made with standard types of batteries to determine their loss of efficiency by self-discharge when kept for any length of time under charge.

A paper was also presented at the Friday session by Carl Hambuechen on the practical significance of the overvoltage phenomena. It was pointed out that this is often a very important factor in the corrosion of boilers and other forms of iron or steel which becomes subject to electrolytic action.

### A Problem Confronting the Tin Plate Industry

At the Saturday morning session a grave problem which confronts the tin plate industry was discussed by Dr. Edward Gudeman, whose subject was "Corrosion of Metallic Food Containers." The pure food bureaus or commissions of the Federal Government and many of the States are becoming so strict in reference to lead and other metals which may be found in solution in canned goods that the supremacy of the tin can as a food container is seriously threatened. The Federal food bureau in the Department of Agriculture has recently made a ruling on imported food products in tin cans of so strict a character that it will almost prohibit the importation of canned foods, and the various State commissions are following very closely the footsteps of the national authorities. Owing to the fact that Dr. Gudeman spoke from notes, subject to revision in a formal paper, only the following brief summary can be given of the facts which he presented:

Carbonic acid under pressure has been found one of the most powerful acids in the corrosion of metals, and food products usually contain other acids which have a very strong corrosive action on metallic cans. It is apparently a serious question whether the State food commissions, if they pursue their present policy, will not condemn the tin can as a container. Exhaustive experiments are now going on to discover some substitute for tin plated iron or steel which will comply with the present tendency of State and national legislation.

When iron or steel is coated with tin, under conditions which form a perfect bond at every point between the iron and protective coating, the result is a noncorrosive plate which resists perfectly the action of foods or beverages. It is claimed, however, that in ordinary commercial practice in the manufacture of tin plate a scientifically perfect product is not made and cannot be produced within the present commercial limit of cost. The methods that it would be necessary to follow to produce a perfectly noncorrosive tin plate would make the cost of the can alone greater than the present market price of a can and its contents.

Experiments have been carried on with various enameling processes, but it is found that the cost is prohibitory in producing a perfect enamel which will not crack.

Experiments are now under way in the impregnation of an iron sheet with glass. It requires only an extremely thin film of glass to answer the purpose, so thin that it has not been measured in any of the tests, and, owing to the manner in which it is applied, no difficulty is anticipated in the manufacture of cans from this product. The principal difficulty confronting this process is that the most satisfactory material from a physical point of view is lead glass, and it is not yet known whether a sufficient quantity of the lead would be dissolved by food products so that it could be discovered by the pure food commissioners.

### Electrostatic Separation

"The Application of Electrostatic Separation to Ore Dressing" was presented by F. S. MacGregor. His paper had been distributed in printed form, and he made an informal talk discussing the features of this process illustrated by stereopticon views. Two plants using it are now in operation, and a third is under construction. One of the completed plants is at Platteville, Wis., and the other at Midvale, Utah. The Wisconsin plant is operated to separate iron pyrite from zinc blende, while the Midvale plant is used to separate zinc from lead ore. The principle which is taken advantage of in this process is that mineral particles are susceptible in varying degrees to an electrostatic charge. Iron pyrite and zinc blende are of almost the same specific gravity, so that they cannot be separated in jigs or other mechanical separators which are so generally used in the mining industry.

At the Utah plant a different purpose is in view in the separation obtained. The zinc in the ore, about 9 per cent., is lost in the smelter, and interferes seriously with the operation of smelting to recover the lead. By the electrostatic process the zinc is separated and recovered as a profitable product, and is also removed as a disturbing element in smelting the lead ore. In the discussion of this paper the statement was made that the amount of zinc lost in the smelting of lead in the United States is equal to the entire commercial production of zinc in this country.

Marcus Ruthenburg of London was on the programme for a paper on "The Electric Furnace and Its Application." He was unable to attend the meeting, but his paper, which was read by the secretary, reviewed briefly the successes obtained in Europe and America in the use of electric furnaces in the smelting and refining of metals, especially in the employment of furnaces in which the slag is used as the resistor for a non-arcing current conducted by carbon electrodes. A notable improvement in the construction of such furnaces which he recommended was the

use of a water jacket on the electrode, and he suggested that the water jacket should be carried down to the surface of the slag. He called attention to the remarkable success which has been obtained in using electric furnaces for the smelting of ores which contain a combination of the base and precious metals.

Several papers were presented on chemical problems at the Saturday session. One was on "The Phenomenon of Crystallization Through Membranes," by Dr. J. H. Walton, Jr. Another, by Dr. L. Kahlenberg, was on "The Relative Basicity of the Metals as Shown by Their Power to Replace One Another in Chemical Compounds." A paper was also read by Dr. David Klein on "The Effect of Water in Causing Chemical Reaction."

Great interest was taken by the members in an exhaustive review by Prof. Robert A. Milliken of experiments he has conducted in "The Isolation of an Ion and a Precision Measurement of Its Charge." He showed as the result of his researches that electric energy is granular in its construction and consists of multiples of the unit of energy carried by an ion. He used lantern slides to illustrate the apparatus by which he had made captives of elusive ions and had measured within a small degree of error the amount of electric energy which is carried by a single ion. His address was received with such interest by the members that he was given the special thanks of the society.

## Important German Mergers

Our German correspondent furnishes the following news relative to important mergers:

"The trade is much interested in two mergers. The Lothringer Hüttenverein Aumetz-Friede announces the purchase of the Victor coal mine, which is situated near Dortmund, for 28,000,000 marks. Aumetz-Friede raises its capital by 16,600,000 marks, to carry out the fusion, thus giving it a total capital of 45,000,000 marks. The motive for the merger is interesting on both sides. Aumetz-Friede, which is situated in Lorraine not far from the French frontier, has an insufficient coal supply, and wants to render itself independent of the Coal Syndicate. The owners of the Victor mine, on the other hand, have an allotment in the Coal Syndicate hardly more than half of its producing capacity, and by selling out to the steel company the mine can be operated at once to its full capacity. An interesting point is the fact that its principal owner is the great Gelsenkirchen Company, the second biggest coal and iron company in Germany after Krupps; and it is believed that Gelsenkirchen will take payment for its shares in the stock of Aumetz-Friede, and thus secure one or more seats on the latter's board. This makes another important step toward huge combinations in the iron trade.

"The second fusion is that of the Düsseldorf Röhren und Walzwerke with the great Phönix Company. The latter adds 6,000,000 marks to its capital, already 100,000,000 marks, in order to acquire the tube mill. This operation is another instance of the policy of the biggest iron companies to include as many finished products in their processes of manufacture as possible. Both fusions are also interpreted by the press to mean that the big companies are preparing for the dissolution of the Steel Works Union [Steel Syndicate] two years hence, grave doubts having arisen as to the possibility of renewing it. The compaies are meanwhile strengthening themselves with a view to standing alone."

The Lehigh Valley Railroad Company announces its withdrawal from the car demurrage bureaus in its territory, and will handle demurrage affairs through its own organization after November 1. By this new arrangement the company will be better able to prevent the delay incident to the holding of cars, and will expedite traffic in such a manner as to benefit the railroad, the shippers and the public in general. The same action has been taken by other large roads.

## The New York Subway System

An informal meeting of engineers was held at the Engineering Societies' Building, on Monday evening, October 17, to discuss the rapid transit requirements of Greater New York. Frank J. Sprague, past president of the American Institute of Electrical Engineers, under whose auspices the meeting was held, presented a paper which dealt exhaustively with the subway situation.

The first part of the paper was historical. Passing to a consideration of the proposed Tri-borough subway, Mr. Sprague declared that the system was mistakenly conceived and unwisely promoted and that if its construction as now planned was persisted in the result would be financial disaster. The paper contained an approximate estimate of the prospective cost of this route of $170,000,000 for construction and equipment and he went on to say that the annual interest charges on this investment of private capital would require the full fare of 152,000 passengers daily to cover the difference between these charges and those of the present system.

In conclusion the paper made the following recommendations:

Rejection of all bids for the construction alone by the city money of portions of the Tri-borough route and the withdrawal of all present plans and specifications.

Cessation of negotiations relating to general third tracking and extensions of the elevated railroad, considered independently of the subway extensions.

The prompt determination of a new and independent route following in general Lexington and Seventh avenues, with a junction between Forty-second and Thirty-sixth streets, so planned and proportioned that it may be constructed and operated independently of the present subway system, or, if satisfactory arrangements can be made, as an integral part of it, and the preparation of new plans on reduced dimensions, with invitations to bid on this proposed route.

The preparation of a comprehensive plan of subways using the composite system formed by an ultimate union of the present subway system and the proposed Lexington-Seventh avenue line as a nucleus, so designed that the equipment of all underground railroads of New York City can be interchangeably operated.

Abandonment of the proposition for the indefinite possible use of the subway by foreign cars, and the limitation of its use to strictly urban purposes.

William J. Wilgus, formerly vice-president of the New York Central & Hudson River Railroad, opened the discussion and agreed with Mr. Sprague. One of the special points made was that the Tri-borough route as laid out was too large for cars used on the present system and too small for the standard railway cars, and this increased size augmented the cost some $30,000,000, which was wholly useless. Another bad feature of the system as laid out was the lack of physical connection between the Broadway-Lexington avenue line and the Canal street crosstown line leading to the Bridge loop. The system proposed by Mr. Sprague, he said, was not open to these objections, as it provided transfer facilities with the Hudson-Manhattan tunnels and a physical connection with the Canal street crosstown line and others with the present system.

Lewis B. Stillwell, formerly consulting engineer of the Interborough Company and at present consulting engineer of the Hudson-Manhattan Company and past president of the Institute, continuing the discussion said that the route as laid out was faulty. In his opinion it ought to be constructed either as an integral part of the Interborough system or else to compete with it, neither of which was possible under the present arrangements.

William S. Murray, electrical engineer of the New York, New Haven & Hartford Railroad, was the last speaker, and said he was thoroughly in favor of the route proposed by Mr. Sprague.

## New Publications

**Machine Drawing.** By Gardner C. Anthony. Size, 6 x 7½ in.; 104 pages; 127 figures. Cloth bound. Price, $1.50. Published by D. C. Heath & Co., 124 Boylston street, Boston, Mass.

This is the second edition of the book, which forms one of the Technical Drawing Series of the publisher, and is designed to promote exact methods of thought and clear expression in graphic language. It has been the aim of the author to teach and encourage the use of concise, graphic terms by adopting the idiomatic phrases of the engineer and to suggest many useful means for acquiring facility in this form of expression. It recommends certain types of letters, character of titles, size of paper and treatment of subjects to simplify the instruction and avoid the confusion incident to greater freedom in interpretation, but does not aim to instruct the prospective draftsman concerning the best methods of conducting a modern drafting room.

The book is divided into seven chapters and an appendix containing a number of tables. The first two chapters deal with screw threads and bolts and screws, while the next gives general rules for making drawings. Sectional views, dimensioning and technical sketching occupy the next three chapters, while the final one contains a number of examples for practice which have been chosen with a view to obtaining the largest experience consistent with a minimum expenditure of time. The tables given in the appendix include such standard ones as draftsmen are generally required to know and give standard dimensions for screw threads, pipes, pipe flanges, tapers, &c.

**Contracts in Engineering.**—By James Irwin Tucker. Size, 6 x 9 in.; 307 pages. Cloth bound. Price, $3, net. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York City.

This book deals with the interpretation and writing of engineering-commercial agreements and is an elementary text-book for students in engineering, engineers, contractors and business men. It aims especially to familiarize the engineering students with the major principles of common law relating to contracts and touches other legal branches only incidentally and so far as will materially assist him to grasp the doctrines or contract law applying to that subject. The importance of the principles underlying successful specification writing has been recognized, and as the present commercial tendency of engineering causes contracts of business to demand the attention of the modern engineer about equally with those of engineering-construction, the volume has been divided about equally into three parts, dealing with commercial contracts, specification writing and the elementary principles common to all instruments of this nature. To adapt the book for teaching purposes extensive lists of questions and problems have been introduced, and in outlining the various topics, where too many details or correlated ideas are developed, recourse is had to appendix notes.

The book is divided into nine chapters, the first of which is a general introduction to the subject. Chapter II covers the essentials of contracts, while the next chapter deals with the development of contract principles. Chapter IV discusses the relations of the agent and the independent contractor, while chapter V is devoted to real property. Contracts of sale and transportation and contracts of association are covered in the next two chapters. Chapter VIII is concerned with the various kinds of negotiable paper, while the final chapter deals with the preparing and writing of engineering contracts and specifications. An 18-page appendix serves to amplify the text, and an alphabetical index divided into various classifications, such as agency, contracts, corporation, partnership, property, sales, &c., completes the book.

**Hendricks' Commercial Register of the United States.**—Size, 7¼ x 10¼ in.; pages, 1342. Cloth bound. Price, $10 net. Published by F. E. Hendricks Company, 74 Lafayette street, New York City.

This is the nineteenth annual edition of this book, which is the most comprehensive and complete so far and contains 400 columns of index matter or 52 columns more than that of last year. This extra matter represents the manufacturers of approximately 5000 articles, which have not appeared in previous issues. The total number of classifications is 35,841, embracing machines, tools, specialties and materials required in the architectural, electrical, engineering, mechanical, mine, railroad and kindred fields. The present edition contains 124 pages in excess of the directory of last year, and as 114 pages of matter were omitted from this edition which appeared in the last one, the total pages of new matter is 238, and represents in all over 350,000 names and addresses.

The simplicity of its classifications is an important feature of the Commercial Register. These are so arranged that the book may be used for either purchasing or mailing purposes. All manufacturers of a particular trade are first classified under a general heading for mailing purposes, and each firm or corporation appears again under as many classifications as the variety of its products requires. Considerable information is given following the names of a number of firms which is of assistance to the buyer and saves the expense of writing to a number of firms for the particular article desired. As far as possible the trade names of all the articles classified are included and appear in parentheses between the names and addresses of the different firms appearing under the classifications.

## A Fourth Recalescence in Steel

Data concerning a fourth recalescence in steel were given by Prof. J. O. Arnold in a lecture before the chemical section of the British Association for the Advancement of Science, at Sheffield, England, September 6, 1910. The facts presented, it was explained, were not developed in any recent research, but came from accumulated thermal and micrographic observations extending over nearly 20 years. The author's view is that the fourth phase of recalescence is due to the heat evolved during the segregation of the ultimate micrographic constituents of steel, begun at $Ar_1$ and completed at $Ar_1$, during the cooling of an unsaturated steel at a moderate rate, or about 0.5 degree per second. He believes that between the points named the ferrite and hardenite fall out from their state of mutual interpenetration or solid solution into microscopically visible masses. It is suggested that the maximum heat of the fourth phase of recalescence is evolved from a semisaturated steel—namely, iron containing about 0.45 per cent. carbon, and hence having in the cold a micrographic structure consisting of 50 per cent. ferrite and 50 per cent. pearlite.

The National Founders' Association will hold its fourteenth annual convention at the new Hotel La Salle, Chicago, on Wednesday and Thursday, November 16 and 17. On Tuesday evening a meeting of the Administrative Council will take place. On the same evening the annual alumni dinner for members of the Council will be held, and on Wednesday evening the annual banquet for the members of the association. Prominent speakers of national reputation have been engaged for the latter occasion.

# A Large Norcross Molding Machine

## A Jolt Ramming Model for Heavy Foundry Work

One of the recent products of the Arcade Mfg. Company, Freeport, Ill., is the large Norcross jolt ramming molding machine illustrated herewith. Fig. 1 is a general view of the machine, while, Fig. 2 shows a group of typical castings from molds made on this machine. It was especially designed for use in foundries where heavy loads and long flasks are required since the power is equalized and the load distributed over the entire machine. This is said to be the largest machine of its kind ever built and embodies constructural features that are radical departures from those in existing machines.

Three cylinders have been provided to obviate the difficulty usually experienced in jolting molds which are not accurately centered on the table of the machine. The two end cylinders have the same diameter, 20 in., while the central one is 7½ in. larger. The pistons operate in unison and when loads of from 6 to 8 tons have been placed at the extreme end of the table the results have been the same as if the load was located at the center. The general mechanism of this new model is identical with that of the company's regular type and is claimed to be very simple. No working parts are exposed to the action of the sand. The stroke is the same in both models, namely, ¾ in. The machine is rigidly constructed and its weight is 25,000 lb. When operating at an air pressure of 80 lb. the ramming load capacity is between 40,000 and 45,000 lb. for the machine illustrated, which has a 6 by 12 ft. table, and a base of the same size. There are over 1000 sq. in. of guiding surface and more than 90 sq. in. of contact surfaces divided between the three pistons.

Besides the model illustrated, four other sizes are built. The table in the smallest size measures 6 x 10 ft. and the capacity of it is the same as that of the 6 x 12 ft. table which is from 40,000 to 45,000 lb. The capacity of the next two sizes is the same, 55,000 lb., while the tables are 6½ x 12 ft. and 7 x 14 ft., respectively. The largest machine has a table measuring 7½ x 16 ft. and the ramming load capacity is 75,000 lb. If required a table of even greater length can be furnished. A two cylinder model in which the cylinder diameter is 21 in. and the table 6 x 9 ft. is also built. The capacity of these two machines varies from 32,000 to 35,000 lb.

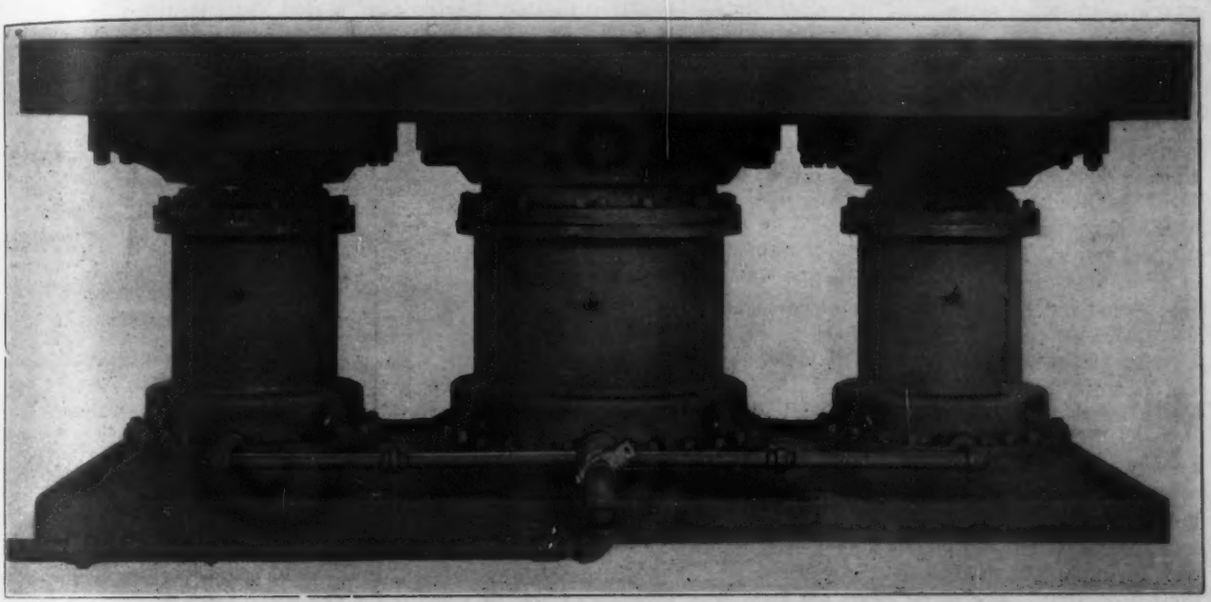

Fig. 1.—A Norcross Jolting Machine with Table Measuring 6 x 12 Ft., Built by the Arcade Mfg. Company, Freeport, Ill.

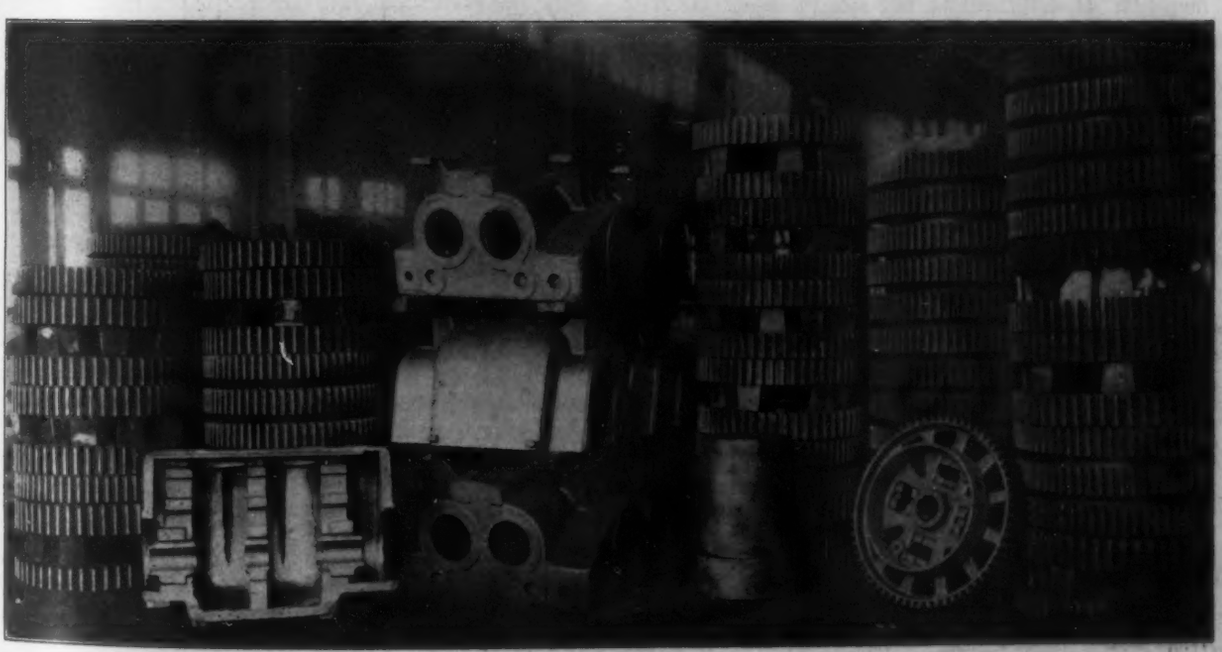

Fig. 2.—A Group of Castings from Molds Made on This Machine.

# Co-operation in the Steel Industry*

## The Results Already Achieved and Reasons for the Extension of the Policy—The Law of Supply and Demand

BY ELBERT H. GARY.

At this first formal meeting of the American Iron and Steel Institute, it is my privilege and no less my pleasure to felicitate the members on the success which has already been reached as the result of an earnest and untiring effort on the part of each to engender a feeling of affection among the members and to promote the welfare of the institute regardless of any personal or selfish interest. The disposition you have shown, if maintained, will result in benefits that cannot at this time be measured. Especially are we to be congratulated that so many from foreign countries are with us. We realize that these visitors are men of important affairs, and have in their charge and control properties and business of great magnitude which they could not leave even for a short time without considerable sacrifice. We understand they are here to evidence a desire, so far as practicable, to work with us in the endeavor to better the conditions of all.

In behalf of the institute I bid these foreign gentlemen thrice welcome. We are delighted with their presence, and we are proud of their acquaintance. We offer to them our congratulations for their achievements in their own respective countries, personally and as representatives of large aggregations of wealth and business. With no spirit of envy do we read of their prosperity. For many years we have been learning from them, adopting their discoveries and their methods. It shall ever be our aim to co-operate with them in placing and keeping upon a better basis the lines of business in which we are engaged, and in cementing the friendship which exists and which we hope may be permanent, not only as between them and ourselves but as between their countries and our country. Before their departure we hope to give to them proofs of the sincerity of our professions of esteem.

### The Growth of the Iron and Steel Industry at Home

The production of iron ore, pig iron, steel and coke in the United States and Canada, the using in all cases round numbers amounted to the following in the years stated:

*Iron Ore.*

| | Tons. | | Tons. |
|---|---|---|---|
| 1880 | 7,000,000 | 1900 | 27,500,000 |
| 1890 | 16,000,000 | 1909 | 53,000,000 |

*Pig Iron.*

| | | | |
|---|---|---|---|
| 1880 | 4,000,000 | 1900 | 14,000,000 |
| 1890 | 9,000,000 | 1909 | 26,500,000 |

*Steel.*

| | | | |
|---|---|---|---|
| 1880 | 1,250,000 | 1900 | 10,000,000 |
| 1890 | 4,300,000 | 1909 | 25,000,000 |

[The increase in the production of steel did not correspond with the increase in the production of pig iron, for the obvious reason that a good deal of scrap was melted, and therefore iron was used the second time.]

*Coke.*

| | Tons. | | Tons. |
|---|---|---|---|
| 1880 | 3,500,000 | 1900 | 20,500,000 |
| 1890 | 11,500,000 | 1909 | 41,000,000 |

### Possible Future Production

If the ratio of increase during the next 20 years should be the same in each decade over production at the close of the preceding decade as that which took place in the 10 years from 1900 to 1909, there would be produced the following amounts:

*Iron Ore.*

| | Tons. | | Tons. |
|---|---|---|---|
| 1920 | 102,000,000 | 1930 | 197,000,000 |

*Pig Iron.*

| | | | |
|---|---|---|---|
| 1920 | 50,000,000 | 1930 | 94,500,000 |

*Steel.*

| | | | |
|---|---|---|---|
| 1920 | 62,500,000 | 1930 | 150,000,000 |

*Coke.*

| | | | |
|---|---|---|---|
| 1920 | 82,000,000 | 1930 | 166,000,000 |

* Presidential address at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

As the figures given begin from a low basis in 1880, it is probable the same ratio of increases for the next 20 years is not justified. However, if the increase in tonnage during that period shall be the same in each decade over the production at the close of the preceding decade as that which took place in the 10 years from 1900 to 1909, inclusive, then and on that basis the production would be:

*Iron Ore.*

| | Tons. | | Tons. |
|---|---|---|---|
| 1920 | 78,500,000 | 1930 | 104,000,000 |

*Pig Iron.*

| | | | |
|---|---|---|---|
| 1920 | 39,000,000 | 1930 | 51,300,000 |

*Steel.*

| | | | |
|---|---|---|---|
| 1920 | 40,000,000 | 1930 | 55,000,000 |

*Coke.*

| | | | |
|---|---|---|---|
| 1920 | 61,500,000 | 1930 | 82,000,000 |

### Reasons for the New Organization

Reference has been made to the magnitude and growth of the iron and steel industry of America, as evidenced by these figures, for the purpose of emphasizing the importance and the opportunities of the American Iron and Steel Institute, and the necessity for its existence.

There have been for some time other associations which were calculated to develop and improve the iron and steel industry by the accumulation and distribution of statistics, or by the study and discussion of numerous technical questions, and these associations have been very successful and satisfactory; but it has been felt they were not, in practice at least, of sufficient scope and breadth to fully cover all the necessities of those who are engaged in or connected with the iron and steel trade. Due credit has been and will be given to those organizations, and there is no disposition to antagonize or interfere with or detract from any of them. On the contrary, we hope to affiliate with them, directly or indirectly, and assist in the good work in which they are engaged.

It seemed to the great army of individuals who have been particularly interested in successfully conducting this branch of industry that they had not, prior to the formation of this Institute, a common meeting place where it would be appropriate to consider any and all of the important questions which apply to their lines of activity. In some respects, at least, methods had theretofore been unsatisfactory. Each individual was to some extent managing his affairs without regard to the rights or interests of others. The results are well known and have been so frequently referred to as to make it unnecessary to dwell upon them at this time. That it was essential to do something to change and improve these conditions we all insist.

And so this institution was created upon a basis so broad that there is no limit to the good which may be accomplished. Its object is to afford means of communication between members of the iron and steel trades upon matters bearing upon their business affairs. Of course this does not mean the undue advancement of the claims of any member to the prejudice of other members or of any one outside.

As stated by many of you during the period of formation of the Institute, it is intended that ethical questions shall be considered as important as economic or scientific questions. The rights and duties of each member, so far as his conduct relating to this particular department of industry is concerned, and within the lines of propriety, should always be matters for the deliberation of the whole membership of the In-

stitute. The level occupied by the Institute is high, and its management must always be above reproach, and in all the questions which may properly be considered by the Institute the pecuniary interests and the honor of each member are alike involved.

These general references are made because they are in accordanc with the pronounced opinions of the charter members and should be emphasized at the outset.

Primarily the Institute was organized, and should be conducted, for the benefit of its members. It should result in decided pecuniary advantage to all. The opportunities for presentation and discussion of economic or scientific questions are likely to give all a clearer understanding of all the facts and circumstances applicable to the management of the factories, and furnaces, and mills, and their connections, so that every one possessed of the necessary knowledge may deal with reference to the rights of all concerned.

Also the consideration and discussion of ethical questions, particularly affecting those outside of the membership, but connected with or interested in the conduct of their affairs, should be deemed just as essential and should result in material benefit to all.

### The Question of Prices

One of the most importnat business matters at this time, and perhaps at all times, is the maintenance of stable conditions in the iron and steel industry; and to this is attached the question of prices. For periods, at least, in the past unsatisfactory conditions have been the rule and not the exception. Violent, sudden and wide fluctuations in prices have occurred, and they have been detrimental to every one connected with the business and to the public generally. The steel and iron industry, more or less recognized as the barometer of trade, has had an influence on general conditions for good or bad, and much of the time for bad. We do not advocate, and never have, fixed unchangeable prices. If they are unreasonably high they should be lowered, and vice versa. If for any good reason at any time we are convinced that the rights and interests of ourselves, our employees, or our customers demand decreases in selling prices or the readjustment of prices, we should be prompt to make them. This does not, however, militate against the general proposition in favor of stability as opposed to demoralization. We know, as a matter of fact, from most careful observation and an abundance of testimony from those directly affected, that the maintenance of fair prices and the prevention of sudden and wide fluctuations is desired by our customers themselves.

### The Buyer's Interest in Stability

If you suggest that many members of this Institute are purchasers or consumers of the commodities produced by others, and therefore may object to the position taken, the obvious answer is that they do not object. Many of them purchase with the view of converting or refining and selling the product. Many have stocks of materials on hand from time to time and cannot afford, and do not desire, to have the values of inventories reduced. Besides consumers like to feel that they can depend upon prices which they pay being as low as the prices which their neighbors subsequently pay. We are all purchasers and consumers of one thing or another. We sell certain manufactured products; but we buy a greater variety of products; and we like to feel that we are at all times treated as our neighbors are treated. If we go to the tailor, the butcher, the grocer, the farmer, the railroad company, the steamship line, the telegraph office, the newspaper office, or to any others having for sale that which we need and buy, we are better satisfied if we are certain we are treated like our neighbors, and that there will be no sudden and material decreases immediately after we have bought and before we have had opportunity to consume the product which we have purchased. It is pleasing to note that in much of the business transacted in this country—commercial, financial and industrial—there is a tendency toward an even, steady and continuing basis of action. It would be better for us all, and better for the country, if conditions in all departments of business were more stable and less likely to be disturbed by agitation, doubt or distrust.

### The Law of Supply and Demand

It has sometimes been urged that an effort to maintain reasonable prices for iron and steel is contrary to the natural laws of trade; that it is opposed to the law of supply and demand. This we do not admit We do not undertake nor advocate anything unreasonable, unnatural or unfair. Those who oppose the maintenance of fair prices when the volume of business is low, on the ground that it is contrary to the law of supply and demand, make the mistake of supposing that capacity to produce creates supply. The law of supply and demand means the quantity which one possesses and is willing to dispose of and the quantity which another desires to possess and is willing to buy. Capacity to furnish does not create supply; nor does ability to purchase create demand. It is just as illogical to say that because one is able to furnish a given quantity, that is evidence of the supply, as it would be to say that because another can use and has the money to pay for a certain quantity, that constitutes a demand. The whole question should depend upon mutual consideration and decision. The seller should never take advantage of the necessities of the consumer to advance prices unreasonably, nor should advantage be taken of the necessities of the producer to secure his product at an unreasonably low price.

### The Policy for Producer and Consumer

What, then, should the manufacturer do at times when the consumers or purchasers are not willing to pay the price demanded, however reasonable it may be? Many of us, at least, believe he should reduce the output to meet the demand, much or little, and wait until those in need are willing to pay what is fair and right. Remember, this assertion is based on the assumption that prices at all times must be fair and reasonable and subject to reductions or changes whenever it is decided they ought to be made. Such reductions, however, should be made only after due consideration and in an orderly way, and not as the result of panic.

On the other hand, if prices are at any time higher than they ought to be, the consumer, whatever his pecuniary ability to pay may be, should wait until the prices are reduced. If the attitude of both seller and purchaser should be as suggested, it would not be long before they would get together on a proper basis, especially if what we advocate shall be carried into actual effect. What has been said is outside of, and without reference to, any question of special privilege or undue advantage or improper control of any commodity which would enable the producer from motives of cupidity or otherwise to fix or maintain unreasonable prices, or to take advantage of the necessities of the consumer. The great aggregations of wealth make this question important; but it may not be appropriate to discuss the same at this time.

### Lawful Methods of Co-operation

Now, how shall we bring about the conditions which have been suggested as ideal? The existence of this Institute and the large attendance on this occasion furnish the answer. Real, hearty, cheerful and continued co-operation on the part of the members will secure results which should be entirely satisfactory. Frank and friendly intercourse; full disclosure of his business by each to the others; recognition by all of the rights of each; a disposition to assist and benefit each other so far as practicable and proper; conduct founded on the belief that healthy competition is wiser

and better than destructive competition—all these are desirable and necessary and will be effective.

Some of you may say that in your opinions, based on the past, a fair and just equilibrium cannot be maintained except as the result of some agreement on the part of those who are interested. It is a sufficient answer to make that you have no right to enter into such an agreement, express or implied; that the laws of this country are opposed to it. But, as stated by the Attorney General of the United States in his argument before the Supreme Court in the Standard Oil case, the law does not compel competition; it only prohibits an agreement not to compete. If competitors are in frequent communication and make full disclosure to each other in regard to their business, notifying one another of what they are doing, it will follow as a natural result that no one will take advantage of the information he thus receives to act unjustly or dishonorably toward his neighbor. You know by experience this is so: and it will become more certain as time goes by and each of us realizes more fully his obligations to others and to this Institute.

Co-operation is broadening in its application to specific subjects growing out of the activities of life. We see it in many lines of business outside of our own. We see it in this country and in foreign countries. Especially have we observed it during the last few months in the consideration of some of the matters which have demanded the attention of the Interstate Commerce Commission and other official departments.

### Cultivating Relations with Foreign Producers

Co-operation can be, and should be, extended to our business relations with foreign manufacturers and producers. They will meet us half way. Indeed, the presence at this meeting of so many distinguished and representative men from Great Britain, Germany, Austria, France and Belgium, respectively, is positive proof that they believe in this Institute and are friendly to its members, and have high appreciation of the efforts we have been making in the direction of conciliation and co-operation. Whenever and however we may have opportunity to meet these gentlemen and to legitimately co-operate with them in promoting and conserving their interests as well as our own we should do so without hesitation. We must at all times evidence a disposition to reciprocate the friendship which these gentlemen have shown, and to demonstrate to their satisfaction that we believe thoroughly in the doctrine that we are more or less bound together by business connections, and that we enjoy prosperity when they enjoy it, and that we fail of success when they fail. Many who are present will live to see the time when the spirit of co-operation shall extend even to the government of the nations of the earth.

### The Welfare of Employees

Again, there is no better way of advancing our own interests than to conduct ourselves in such a way as to make it certain we are endeavoring to promote the welfare of others with whom we come in contact. Uppermost in our minds should be the proper consideration of the rights of our employees. Members of this Institute represent corporations or firms which have in their employ hundreds of thousands of men. Many of these workmen are foreigners, who are not familiar with our language or customs. Some of them have been poor and have had few advantages in their native countries and may not be fully able to protect themselves. Whether this be true or not, we should make it certain that all are so treated that they have the opportunity to be well housed, and well fed, and well clothed. So far as we can we should lend our assistance to the improvement of the conditions of our workmen, and, of course, the wages paid should always be fair and reasonable. All of us have discovered since this Institute was formed that there were many things which we could do for the betterment of the condition of the workingman, and we have been prompt to do them. Particularly have we made great strides toward safeguarding our employees against accidental injury. A continuation of the efforts we have been making in this direction will result in securing a larger measure of confidence on their part, and will bring to us the consciousness that not only have we benefited ourselves pecuniarily, but, what is more important, that we have done the right thing. Certain aspects of this subject will be presented in a special paper.

### Co-operation with Customers

Also, we should extend the spirit of co-operation to our customers. We should be sure at all times that we are treating them right. If it is claimed on any occasion by a customer that our prices are too high with respect to any commodity we should promptly take up with him the question for the purpose and with the intention of arriving at a just conclusion. In all cases we advocate the doctrine of co-operation as opposed to independent action. We have found, particularly during the last two or three years, that we are succeeding better as we are brought into closer relations with our customers, giving them our confidence and informing them frankly of our conditions and intentions.

I predict for the Institute a great future. We are ambitious to have it prosper, and shall not be disappointed. So long as we pursue the path we have marked out we shall merit and receive the approval of all who are acquainted with our work. The influence of the Institute for good will be pronounced, and as it is better established and thoroughly known its opinions, as officially expressed on all matters which it may properly consider, will be respected.

For the honor you have conferred upon me personally in electing me your first president and for the cordial support which you have extended without reserve, I thank you sincerely. For your confidence and friendship I am profoundly grateful.

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**The Youngstown Car Mfg. Company.**—Wilkoff Brothers, who recently purchased the plant and equipment of the Youngstown Car Mfg. Company, Youngstown, Ohio, propose to continue the manufacture of steel cars for mine, mill and contractors' uses and also portable track material. An Ohio charter will be applied for, the new owners proposing to operate under the name of the Youngstown Car Mfg. Company. The property consists of 12 acres of land, on which steel and brick buildings, about 80 x 460 ft., divided into erecting and car departments, are located. The establishment will also have close connections with a foundry. The shipping connections are excellent. G. H. Faul, former superintendent of the Youngstown Car Mfg. Company will have charge of the new company's plant. Sales offices will be located in New York, Chicago, Boston, Buffalo and other cities as may be found desirable from time to time.

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The Raymond Mfg. Company, Corry, Pa., is completing an addition to its factory of a building 50 x 135 ft., three stories. So far it is only used for storage purposes. On October 11 a fire occurred in this addition, causing a loss of several thousand dollars. By reason of the first-class construction of the company's buildings it was able to confine the fire to the immediate section in which it originated, and therefore no interruption will be caused in manufacturing nor delay in the filling of orders. The importance of this fire has been greatly exaggerated in some of the daily papers. The company manufactures high grade wire springs.

# Tapping Steel Into Two Ladles

## Noteworthy Record of an Open Hearth Furnace

In the fall of 1909 the Phœnix Iron Company of Phœnixville, Pa., enlarged its steel plant by an additional open hearth furnace. This furnace has just completed its year, and as the results are somewhat unusual they will prove of general interest to manufacturers of open hearth steel.

The furnace is of the standard type, rated at 50 tons. It was run on producer gas, and all the raw material was charged cold, hot metal not being available. The product for the year, which was structural steel, amounted to 43,900 gross tons of ingots. The dimensions of the hearth on the slag line are 36 x 14 ft. Gas chambers are 18 ft. by 11 ft. 6½ in. by 6 ft., and air chambers 18 ft. by 11 ft. 6½ in. by 9 ft. Each gas chamber contains 5500 9-in. brick and each air chamber 8500, making a total of 28,000 standard 9-in. checker brick.

The Maccallum Arrangement for Tapping Steel from a Single Open Hearth Furnace Into Two Ladles.

The particular feature of this furnace which makes such an unusual product possible is that very large heats are charged and the steel is tapped simultaneously into two ladles. This arrangement, which is shown in the illustration, is covered by the Maccallum patents. Attached to the buckstays of the furnace on the tapping side, and operated by levers at a convenient distance from the ladles, is a device which controls the flow of steel into either ladle. The usual charge for the furnace is 335,000 lb. of pig and scrap, and the yield of ingots varies from 135 to 140 gross tons. The best weekly record is 1176 gross tons, and the largest heat tapped is 150 gross tons. The usual number of men operate the furnace, and a large saving has been effected in labor, fuel and repairs.

The Rosedale Foundry & Machine Company, N. S., Pittsburgh, which recently shipped 40 valves, 78 in. in diameter, for use in the lock gates at the Panama Canal, is now working on an order for 80 valves of the same size.

## The Ryerson-Gisholt Alliance

A joint announcement has been issued by Joseph T. Ryerson & Son, Chicago, and the Gisholt Machine Company, Madison, Wis., which marks an important event in the machine tool world. Without any corporate consolidation, a unity of interests has been established between these companies, and Edward L. Ryerson and Clyde M. Carr of the former company become directors of the Gisholt Machine Company.

In furtherance of the plans of the associated interests, an immediate expansion of the Madison plant is provided which will greatly enlarge manufacturing facilities. The Gisholt Machine Company has long held a distinctive position in the manufacture of boring mills, turret lathes, &c., while the house of Joseph T. Ryerson & Son is recognized as one of the strongest general machinery distributors. No definite announcement of policy has as yet been made but it is generally understood that the relationship of these organizations presages a development of considerable magnitude in the machine tool field.

**A New Canadian Merger.**—Under the title of Steel & Radiation, Ltd., a large corporation is to be launched in Canada, having its headquarters in Toronto, which will be a consolidation of a number of concerns now operating in the house heating or building trade. The King Radiator Company and the Expanded Metal & Fireproofing Company have already been taken over, with two other large concerns under consideration, negotiations for which have not yet been completed. It is the intention of the company to start an active selling campaign from coast to coast, operating branches at Winnipeg, Calgary, Vancouver, Quebec and St. John, N. B. It is possible that the new company will erect a plant in Montreal for the manufacture of boilers, radiators, expanded metal, Fenestra metal sash, and other lines connected with the building trade. Considerable American capital will be invested, but the control will be Canadian. S. W. Howard, Toronto, is secretary and treasurer.

# The Inland Steel Company's Works

## Description of the Indiana Harbor Sheet Mills

The recent starting of eight new sheet mills at the Indiana Harbor Works of the Inland Steel Company, Chicago, making 18 hot mills in operation, calls attention to the remarkable growth of this company. With 18 sheet mills in operation, it is now one of the largest producers of open hearth sheets in the world, and its ability to keep its enlarged plant in full operation the past summer, during a period of general trade reaction, is evidence of the recognition which is given in the trade to the merits of open hearth sheets, the Inland Steel Company using its own basic open hearth steel exclusively in all of its finished products.

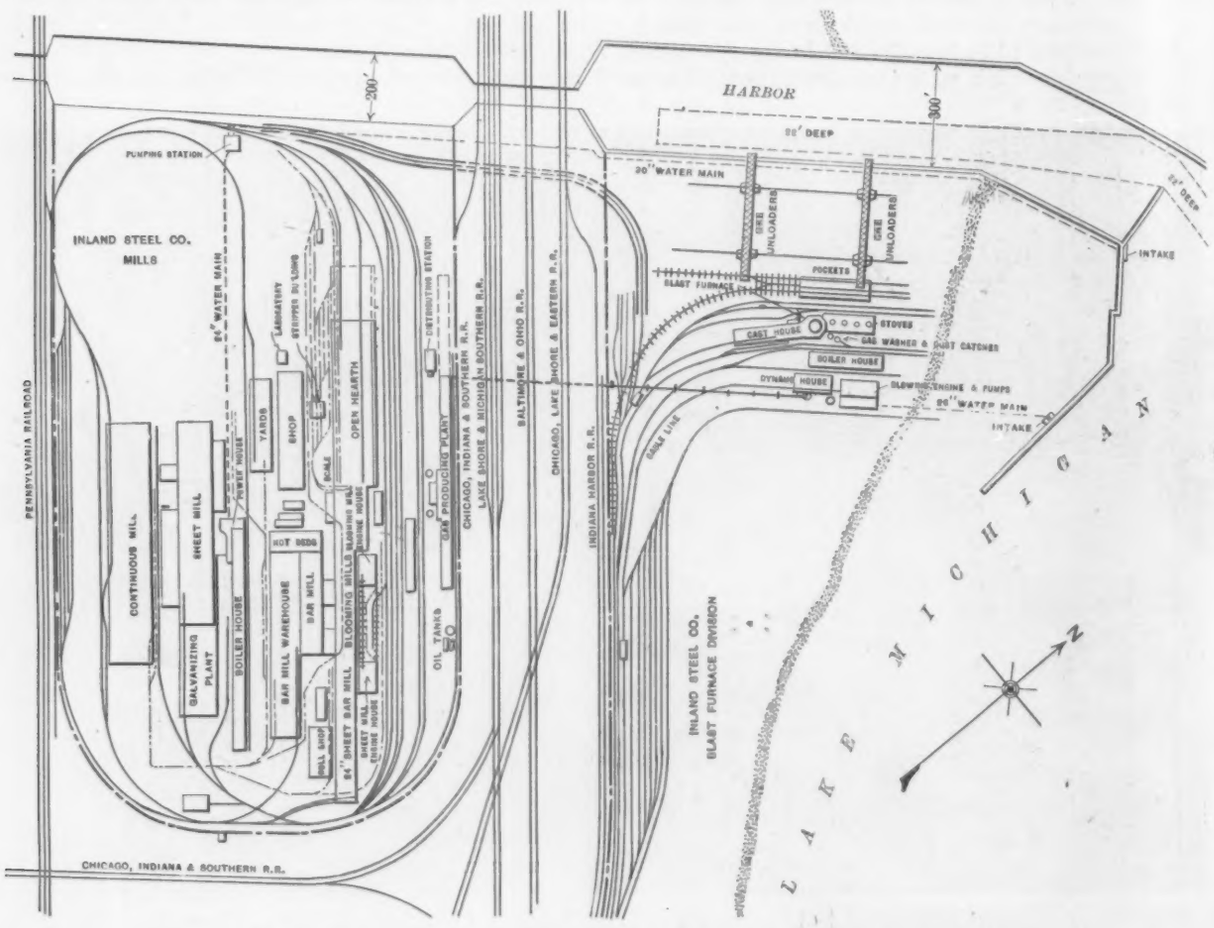



Fig. 1.—Plan of the Inland Steel Company's Works at Indiana Harbor, Ind.

### History of the Company's Operations

A mere description of the new sheet mills would be of little interest to the trade without reference to other important links in the chain of operations resulting in the finished sheets. While the sheet mill itself embodies all the improvements known to the art of rolling sheets, the quality of the material used and the mechanical economy in bringing this material up to the sheet mills are primary factors in the success in the sheet department. Good sheets cannot be rolled from poor material and the best management in the sheet mill itself would not insure commercial success if it were not supported by similar progressive management in every process from the iron ore to the sheet warehouse or shipping platform.

There have been no revolutionary changes in recent years in sheet mill construction. In rolling rails, bars, beams and other heavy steel products, the continuous mill has almost eliminated old-fashioned skilled labor. In rolling sheets, however, skilled labor remains the most important factor. The roller and his helper with their tongs take the hot sheet bar from the furnace and pass it back and forth through a stand of rolls, first through a roughing stand and finally through the hot finishing rolls until the operation is completed. The commercial success of the product depends largely upon what the company does to render more efficient the ability and skill of the workman whose steady eye and strong arm complete the operation of rolling.

Along this line the Inland Steel Company has distinguished itself among the large steel works of the United States. Its plant at Indiana Harbor has been built during the past eight years and therefore embodies all the improvements that have been perfected by mill engineers in recent years.

The nucleus of the company's business was established in Chicago in 1873 by the Chicago Steel Works, the first mill in the United States to roll bars and other steel products from old rails. In 1893 this company was succeeded by the Inland Steel Company and the plant was removed to Chicago Heights, Ill., where it is still conducted for the manufacture of hard steel bars or "rail carbon steel."

In 1902 the Inland Company began a new base of operations at Indiana Harbor, Ind., on the shore of Lake Michigan. The advantages of the Chicago district for the manufacture of open hearth steel had become apparent, and the first unit constructed at Indiana Harbor was an open hearth steel plant with a 32-in. blooming mill, a 24-in. universal merchant mill and eight sheet mills. For several years the company purchased in the open market the basic pig iron required

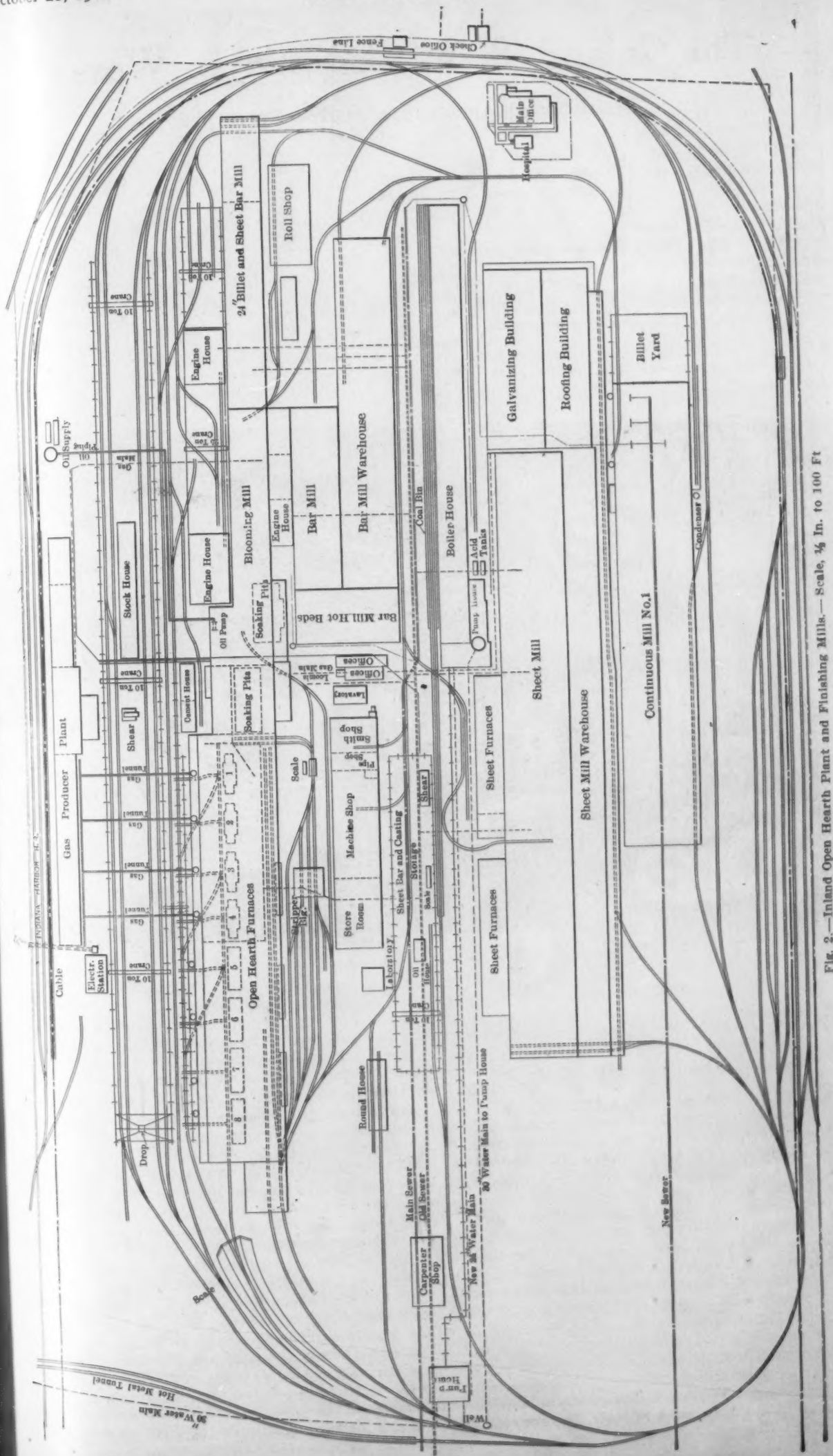



Fig. 2.—Inland Open Hearth Plant and Finishing Mills.—Scale, 1/16 In. to 100 Ft

for its steel plant, but in 1906 it began the construction of a blast furnace, completed in August 1907, in order to obtain a better and more uniform quality of pig iron than could be purchased regularly on the market. In 1907 the company added to its plant a 12-in. continuous bar mill for the rapid production of merchant bars and a 24-in. sheet bar mill. In 1909 it began the construction of two additional open hearth steel furnaces and eight sheet mills, as well as a billet mill to be operated in connection with the blooming and sheet bar mills. This brief historical summary is given to set forth the steady and remarkable growth of the company's operations. Fig. 1 of the accompanying illustrations presents a plan of the entire works, showing the relative location of the blast furnace and the steel plant.

### Features of the General Arrangement

A striking feature of the Indiana Harbor steel plant is the general plan of the buildings, Fig. 2, which promotes the use of electric traveling cranes. The buildings are all long and relatively narrow, and run in parallel lines. There are more than 40 electric traveling cranes in use, ranging in capacity from three and one half to 100 tons. Some of them have runways of over 1300 ft. In the sheet mill and warehouse these cranes have a clear run of 1123 ft., and the three cranes which cover the scrap yard have a runway of 1350 ft. This economical method of handling the material in the plant saves the labor of hundreds of men and is a very important link in the chain of production, as it promotes economy in the cost of the finished product.

The blast furnace, known as Madeline Furnace, is located on the shore of the lake at the mouth of a canal running from the lake inland to the Calumet River through a large manufacturing district. Lake Superior ore is brought from the Hibbing district in Minnesota. Two unloading bridges take the ore from the boat and deposit it in the storage yards. This is one of the few furnaces in the United States where the unloaders could take the ore from the boat and dump it directly in the ore bins of the furnace. In practice, however, this is seldom done as it is necessary to carry a large stock of ore. The ore runs very low in phosphorus and sulphur, for basic iron, a fact which facilitates economy and the production of open hearth steel of a very high quality. The blast furnace furnishes its own power. The gas not required for the hot stoves is burned under boilers which supply steam to the blowing engines, and produce 1650 kw. of electrical power in a power plant adjacent to the furnace. This power plant operates the ore unloaders and other machinery connected with the furnace, and also furnishes all of the electrical power required in the steel mill.

The main lines of the Lake Shore and the Baltimore & Ohio railroads pass between the blast furnace and the steel plant, but a physical difficulty of this character does not embarrass the engineers who design a modern steel plant. At the Inland Works a hot metal tunnel extends from the blast furnace under these railroads to the open hearth plant. This is a substantial concrete tunnel, built for standard gauge railroad cars and locomotives. The hot metal from the blast furnace is poured into 25 ton ladles on specially built railroad cars, and the company's locomotives take the cars across from the blast furnace to the steel plant, bringing the cars alongside the elevated charging floor of the open hearth furnace. A crane lifts the ladle of hot metal from the car and sets it on a standard gauge electric car which serves the furnace. Tracks are laid out on the charging floor which enable this charging car to move up promptly to the door of any furnace that is due for a charge of hot metal, and the car is so convenient in its operation that the contents of one ladle are sometimes divided between two furnaces.

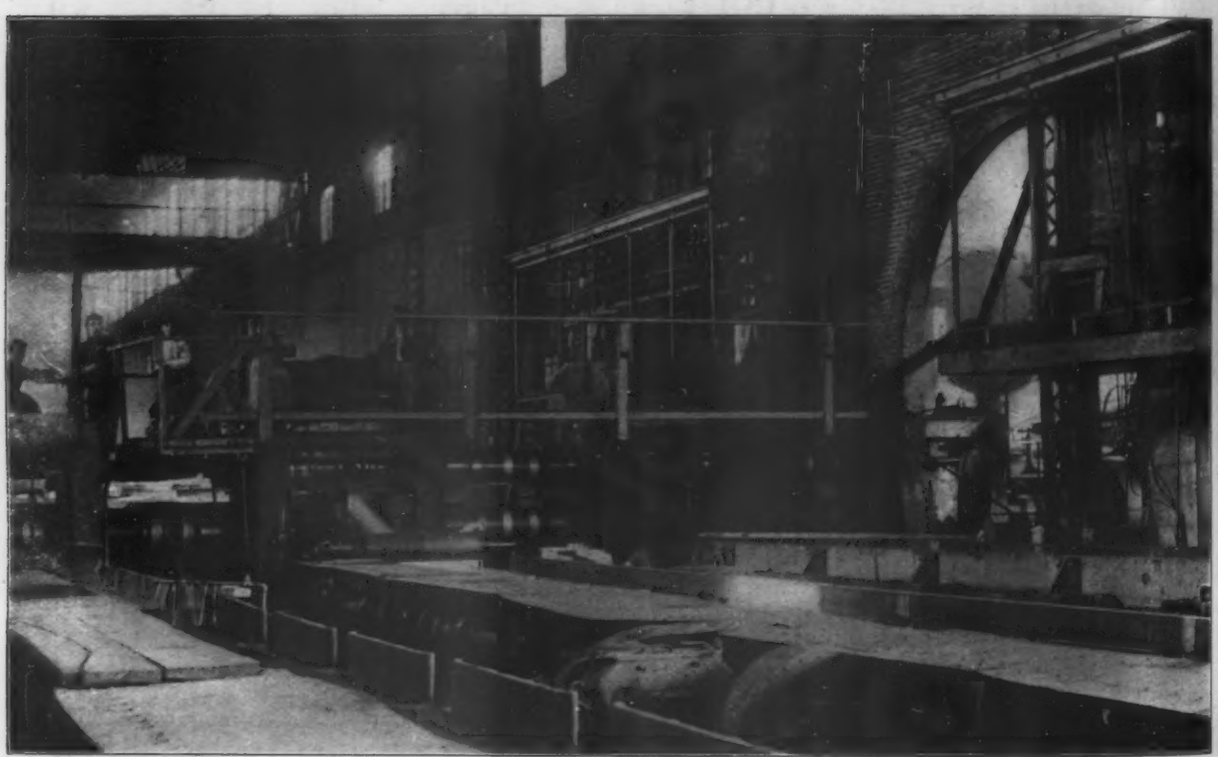


Fig. 3.—Billet and Sheet Bar Mill of the Inland Steel Company.

One of the features of this plant is in the use of fuel oil for heating. This oil is received through a pipe line from the adjoining town of Whiting, Ind., the center of the enormous pipe line system of the Standard Oil Company, which brings to Whiting the product of all the important oil fields of the country, from Pennsylvania to Kansas and Oklahoma. The oil used is free from sulphur and makes a hot steady flame, which is very desirable in the operation of a steel plant. The open hearth furnaces, the charging cars and other features of the plant are all of standard construction and a detailed description is therefore unnecessary.

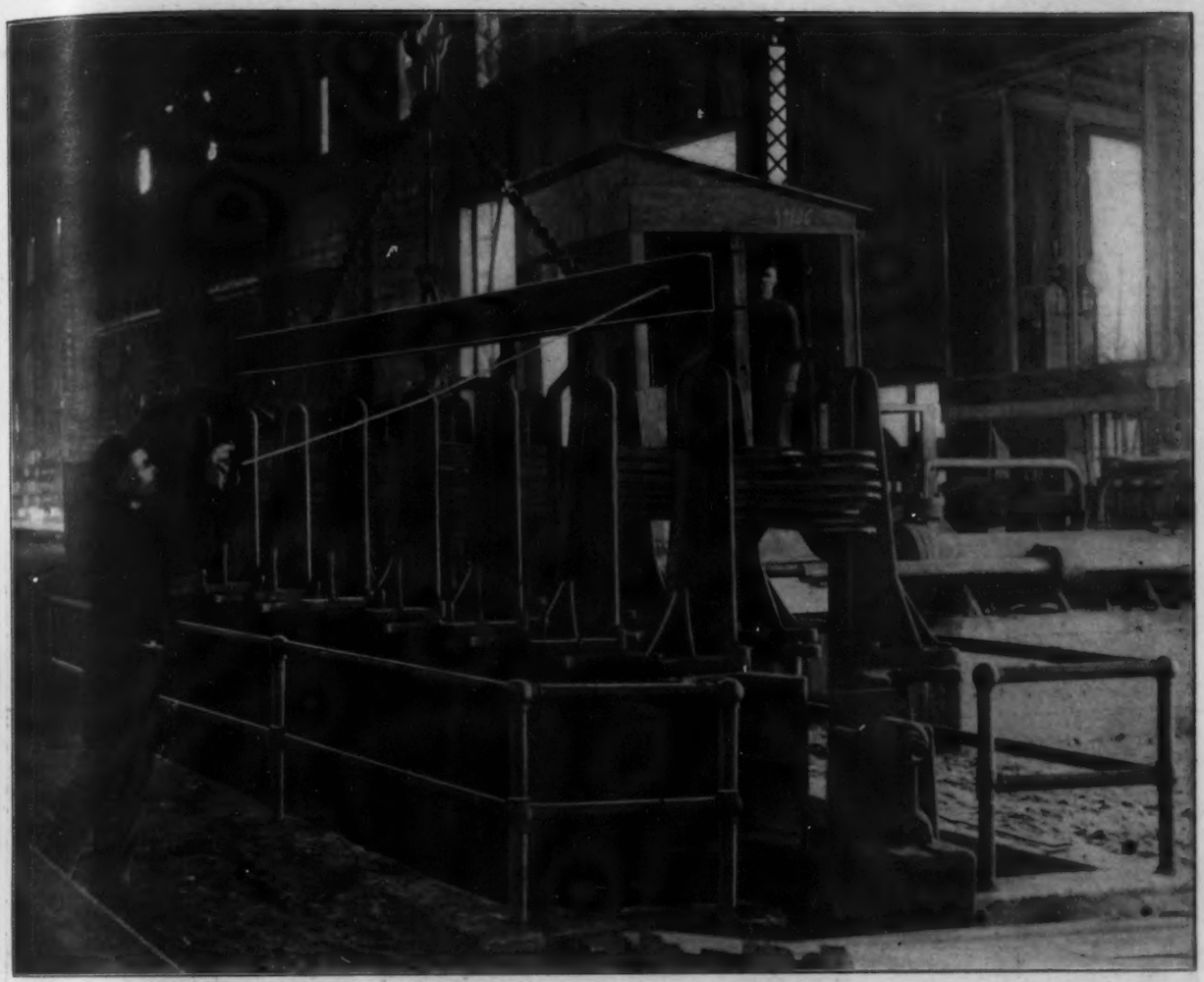


Fig. 4.—Bar Piler in the Inland Works.

The construction of the plant in parallel units, however, makes it a very clean and economical plant in operation and is worthy of special mention.

### The Scrap Yard

The scrap yard is among the largest in the United States, with a capacity of 50,000 to 100,000 tons of scrap. It is the first of the parallel units of the steel plant, approaching it from the blast furnace. The yard extends along the Lake Shore and Baltimore & Ohio railroads a distance of 1350 ft., and is covered by one crane runway with three traveling cranes of 10 tons capacity and 89-ft. span. Each crane carries a magnet, used for unloading the scrap from cars as well as for picking material from the stock pile for the charging boxes. A skull cracker is located at the west end of the scrap yard. A steel trestle is erected at the end of the crane runway of sufficient height to

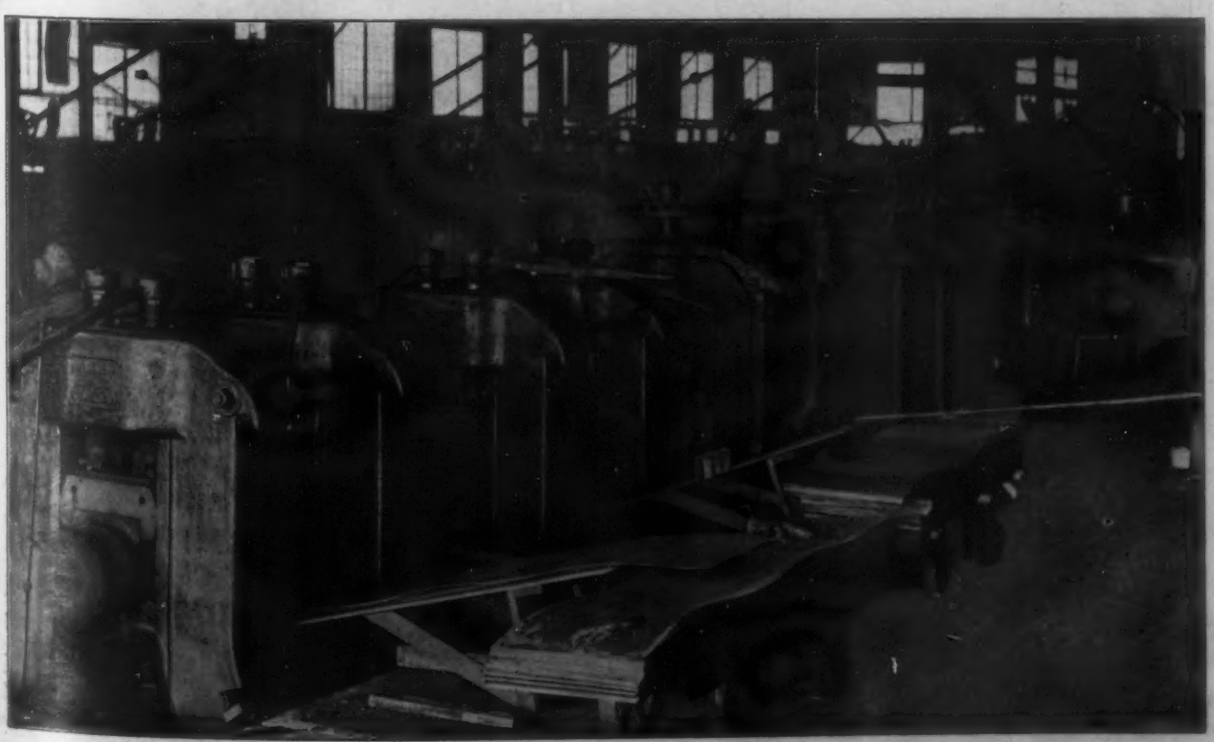


Fig. 5.—Stands of Cold Rolling Sheet Mills in the Inland Works.

afford an 80-ft. drop for the ball, which weighs 10,000 pounds. The cranes with their magnets bring the scrap from the pile to the west end where the charging boxes are loaded.

About midway along the yard is located a powerful scrap shear used for cutting long material to charging box length. This shear is of sufficient capacity and strength to cut 7 x 7 in. cold steel. The charging boxes are carried on small standard gauge cars operated by a special locomotive, the gauge of the track being the same as that on the charging floor of the open hearth furnaces, so that scrap is unloaded from cars, deposited on the stock pile, carried from the stock pile to the charging box cars, and delivered at the charging door of the furnace with practically no hand labor except to sort the charge for each box.

The two open hearth furnaces that were completed last summer are of 60 tons capacity. The six original furnaces were formerly rated at 50 tons capacity each, but have been improved to make their capacity 60 tons per heat.

Fig. 6.—The Inland Galvanizing Department and Sheet Warehouse.

### The Steel Plant

The open hearth furnaces, the soaking pits, the blooming mill, billet mill and sheet bar mill are all housed in one building, 60 x 1598 ft., which constitutes one of the building units of the plant. This building is covered by two 100-ton Morgan cranes of 57-ft. span which handle the ladles from the furnaces to the pouring stands where the steel is poured into molds on cars and transferred to the stripper house, from there to the pits and to the blooming mill. There are 12 soaking pits, each with a capacity for holding eight ingots, heated by producer gas. The blooming mill is of the 36-in. universal type, driven by a Mesta engine 5000 hp., the mill tables being driven by motors. After the blooms are cropped and sheared to the length desired, they may pass on in a direct line on the conveyor table to the 24-in. billet mill, or they may be transferred to the table serving the sheet bar mill.

The billet and sheet bar mills, Fig. 3, are both three high mills of the universal type, operated in the same train and by the same engine, and they are operated alternately according to whether the blooms are to be rolled into billets or into sheet bars. The runout table from the billet mill carries the billets to an upcut shear and then to a side conveyor which drops them on a buggy on which they are carried to the finishing mills. The slabs for the jobbing sheet mills are also rolled on the billet mill, which makes billets up to 6 x 6 in. and slabs up to 2 x 13 in. in size.

A different transportation method is followed in handling the sheet bars. The bars pass from the mill on the runout table to the hot saw and into a bar piler, Fig. 4. This is a cradle or frame work consisting of eight pairs of housings with a movable bottom which is raised and lowered by hydraulic cylinders. The bars drop into the piler until about seven tons have been accumulated, or the product of two to three ingots. The hydraulic lift is then operated to raise the pile to the top of the cradle when dogs operated by springs slip under the pile and hold it in this position. An electric traveling crane then picks up the pile and carries it to the cooling bed, the crane having a cradle with nine dogs or fingers to support the pile, so that the bars are kept straight during their movement from the piler to the cooling bed. The same crane is used to pick up the piles from the cooling bed and load them on standard gauge freight cars on which they are carried around to the stock house of the sheet mill.

The next parallel unit of the plant, adjoining the blooming and billet mill, is the original merchant mill of the company, shown on the plan view drawing, Fig. 2, as the "bar mill." This is a universal reversing 24-in. mill with a very wide range of product. It has the capacity to make bars of all sections, up to 20-in.

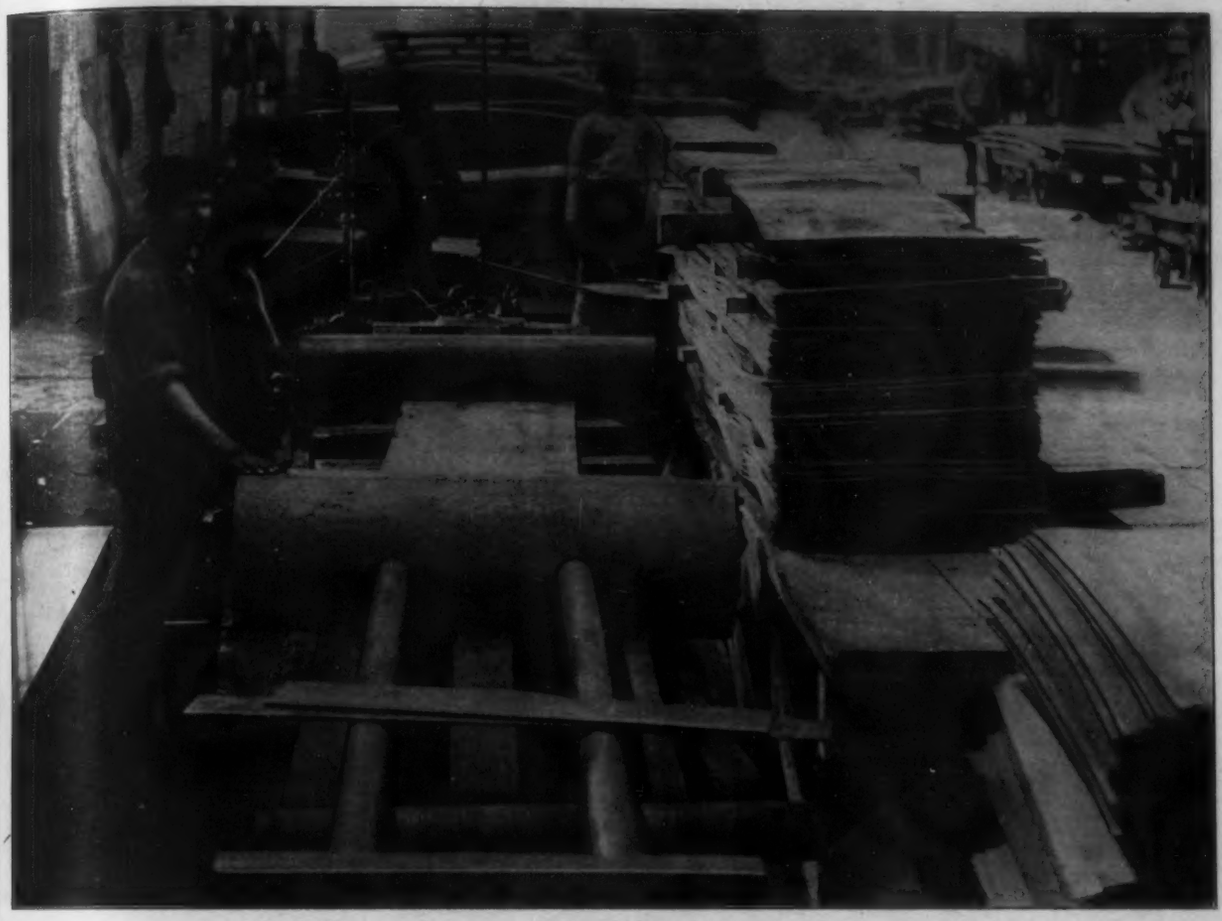


Fig. 7.—Patent Hydraulic Levelers in the Inland Works.

flats, as well as rounds up to 6 in. It rolls structural I-beams and channels up to 13 in., and has proved a valuable unit in the company's plant, owing to the wide range of finished product which it turns out.

The continuous bar mill was described in *The Iron Age* of August 27, 1908. The sheet mill and sheet warehouse lie between it and the older units.

### The Sheet Mills

The 18 sheet mills with their furnaces, the driving engines, the annealing pits, the shears, and the galvanizing plant are all housed in an enormous building 100 x 1133 ft. The stock house extends parallel to this building, and just north of it. The sheet bars and slabs are received from the sheet bar mill and are cut to lengths corresponding to the gauge and size of the sheets to be rolled. The heating furnaces extend along the north side of the building. Sixteen of them are combination sheet and pair furnaces of the Swindell type, and are heated by fuel oil. Two are slab furnaces for the jobbing mills, making 18 furnaces in all, corresponding to and set opposite the 18 mills.

Fig. 8.—Drop Press and Heavy Plate Press in the Inland Works

In a combination furnace of this type the rear of the furnace or the end farthest removed from the mill is used for heating the bar for the roughing rolls, while the front of the furnace, opposite the mill, is used for reheating the sheet for the finishing passes.

The 18 mills with their corresponding roughing rolls are arranged in two trains, one being the old mill and the other train comprising the 8 new mills. Each train is driven by a steam engine, the two engines being located in the center of the building. In the original train of 10 mills there are two jobbing mills for making sheets of the heavier gauges and one tin mill for rolling black sheets. There are also 7 stands of cold rolls for finishing, Fig. 5, in addition to the 15 regular sheet mills.

In the operation of rolling sheets the sheet bar is cut to a length corresponding to the width of the sheet to be rolled, the width and thickness of the bar corresponding to the length or the gauge of the finished sheet. The bar is passed sideways into the roughing mill by the roller, and is returned above the roll by his assistant for the next pass, this operation being continued until the rough sheet has been rolled down to a thickness of perhaps a quarter of an inch. The sheet is then taken to the hot mill and rolled down to about No. 12 gauge, when it goes back into the furnace for reheating.

In rolling the lighter gauges the sheets are doubled and laid in packs of two, four, eight or sometimes ten sheets. At this stage of the operation the intelligence and experience of the roller become most important, in getting the sheets down to the desired gauge without having them weld together in the rolls. The advantages of open hearth steel are very important in rolling sheets of the lighter gauges, as the soft mild steel of homogeneous quality spreads more evenly under the rolls and thus makes a sheet of uniform gauge throughout. If there were a hard spot in one sheet in a pack it would not spread evenly and would tend to reduce the gauge of the softer sheets under it in the same pack, and for this reason open hearth sheets have been found to run more uniformly in thickness.

It has never been found feasible in sheet mill operation to regulate the gauge of the finished product by any rigid adjustment of the rolls. The gauge is determined by the amount of material in the bar and the width and length to which it is to be rolled. The roller knows he has reached the desired gauge when the sheet has been rolled out to the size corresponding to the bar.

### The Annealing and Galvanizing Departments

From the finishing mills the sheets go to the shears which square them up to exact size, the squared sheets being stacked in piles of about 35,000 pounds for annealing. The sheet mill and annealing floor are covered by two 50-ton cranes. There are 18 annealing pits which are heated by fuel oil. A "pack" of about 35,000 pounds of sheets is placed on the bottom of the annealing box and the heavy cover is then lowered over it, to protect the sheets from contact with the flame and gases which might have the effect of oxidizing them. The box with its contents is then lowered into the pit and kept for 12 to 15 hours at a temperature of 1200 to 1300 degrees, when the box is removed to a cooling pit where its burden cools slowly, out of contact with the air.

The annealing floor with its pits is located in the east end of the sheet mill. Beyond it, and occupying the extreme eastern end of the building, is the galvanizing department, Fig. 6. In this department there are four pickling tanks and eight galvanizing pots, all covered by a crane which serves them. After being pickled and washed the sheets go to the galvanizing pots, where they pass, one at a time, through a chain conveyor which carries them slowly through the bath of spelter and discharges them on a conveyor at the opposite side, on which they travel across the

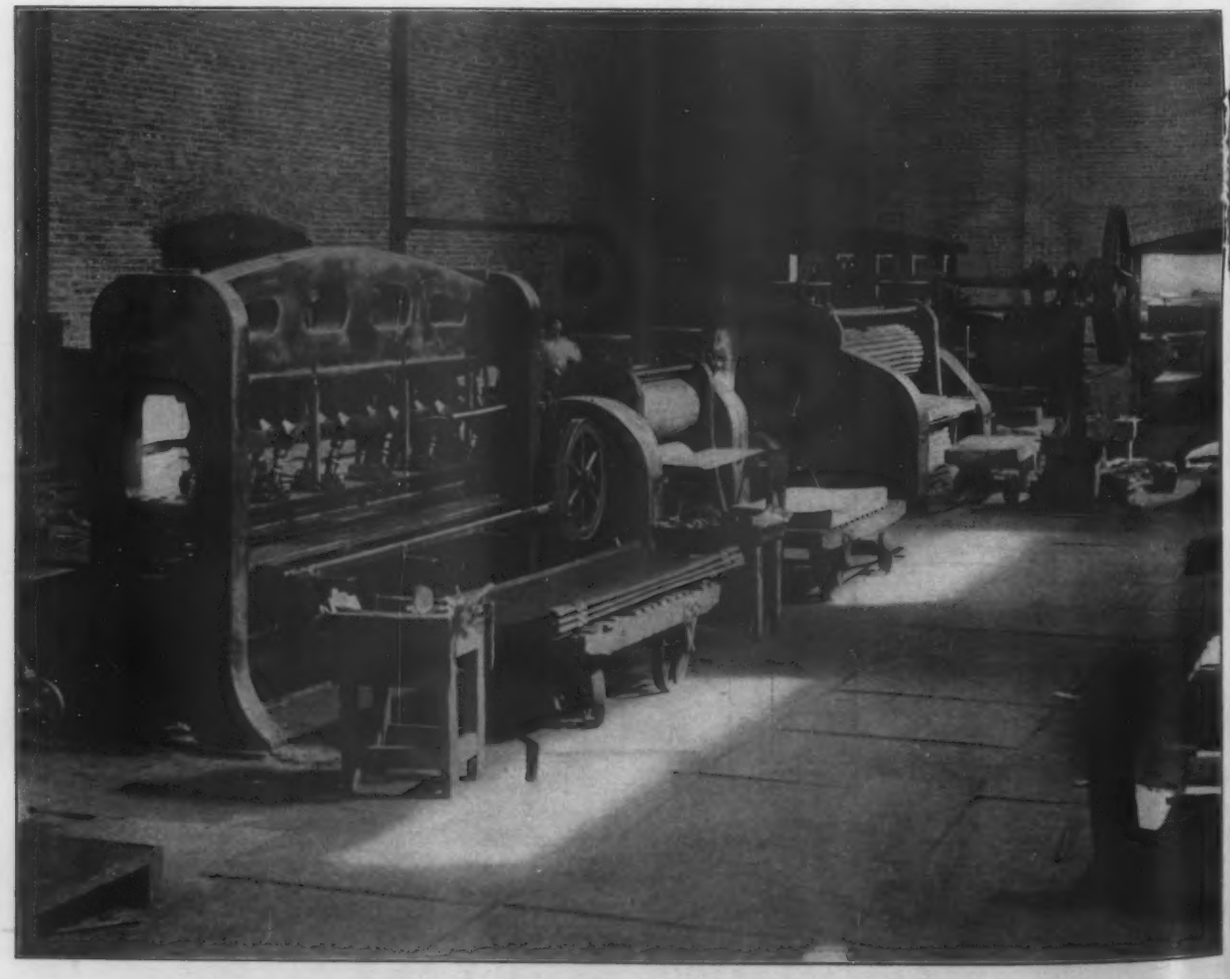


Fig. 9.—Toggle Press and Corrugating Machine in the Inland Works.

Fig. 10.—Roof Painting Machine in the Inland Works.

building into the inspection and shipping department.

The pickling room for black sheets is located in the northwest corner of the building. In the galvanizing department, the sheets are held in a stationary vertical position in the tank and the solution is agitated by a dasher which rises and falls in an adjoining compartment of the tank. In the black pickling room, however, a bundle of sheets is suspended from a spider which is supported by a steam cylinder. As the spider rises and falls, the bundle of sheets is churned in the tank. There are four arms on this spider, operating over two pickling tanks.

### The Sheet Warehouse

The sheet warehouse of these mills is more than a warehouse, being in fact an important link in the system of production. In rolling bars or other products of shaped section, it is necessary to change the rolls of the mill to correspond with the specifications of each order on which the mill is operated. That is to say, these products are only rolled according to the orders and specifications given by the customer. In a merchant sheet mill, however, the orders come from the trade in an almost infinite variety of widths, lengths and gauges. The Inland mills range in width up to 52 in., but a sheet mill cannot be changed like the rolls on other mills. There is a further complication in the fact that when newly turned rolls are put on a sheet mill they will only roll the full width for a few days, as the rolls work together at the end and have a tendency to weld the edges of the sheets. For this reason it is necessary to gradually decrease the width of the stock on a pair of rolls until they are turned again. The ordinary plan in steel mills of adjusting the mill to the specifications of the buyer is therefore impracticable.

The plan followed in the Inland mill is to keep each mill in steady operation on the size and gauge for which it is best adapted, and accumulate a stock in the warehouse of all gauges and sizes. By this plan the mills are kept in steady operation and the buyer does not have to wait for weeks or months until the mill can roll all the sizes or gauges called for in his order. This gives to the enormous Inland warehouse a producing function, since it increases the capacity of the mill. In a commercial sense, the warehouse is also a producer as it attracts the business of the buyer by assuring him better accommodations than if he had to wait for the mill to roll all the sizes and gauges that he specified in an order. This warehouse is used only for carload business and is not designed as an agency to sell less than carload lots "from store."

The loading dock of the sheet warehouse extends the full length of the building, and 30 cars or more can be loaded at one time. The traveling cranes run the entire length of the warehouse, 872 ft.

### Finishing Operations in the Warehouse

The east end of this enormous warehouse is devoted to finishing operations of an interesting character. A group of machines, Figs. 7 to 10, is installed here for finishing and fabricating operations. There is a stand of corrugating rolls for making standard corrugated roofing and siding. Another machine of the same character and operating in the same manner makes narrow corrugations, or crimped sheets. Another machine operating on the same principle has a pair of rolls which give a brick face finish. A drop press makes a rock face finish and there are also presses and brakes for making roof capping and other special forms which jobbers carry in stock. A painting machine for painting black sheets has a pair of rolls to paint sheets quickly on both sides. The company is enlarging its operations from time to time in this department, installing machines to make any form or character of work for which there is a regular demand from the trade.

The general policy of the company has been to develop its plant step by step, adding new units as rapidly as the trade will sustain them and the capital becomes available for further operation. One of the chief aims of the management has been to build up a strong, harmonious organization. The plant is kept in continuous operation year after year by following the market, through unprofitable periods as well as prosperous seasons. In this way the organization is kept together and the men in the mill are given continuous employment.

# The International Congress at Düsseldorf, Germany*

## Its Papers a Resume of German Progress in Fuel Economy and in the Manufacture of Iron and Steel—European and American Conditions Approximating

BY C. KIRCHHOFF, NEW YORK.

The Fifth International Congress of Mining, Metallurgy, Applied Mechanics and Practical Geology was held this year in June at Düsseldorf, Germany. As compared with the first gathering at Paris in 1878, the attendance of delegates, the high character, variety and scope of the papers illustrated well the wonderful progress made since then. Now there is an army of trained scientific observers in close touch with practice where once they might have been counted on the fingers of both hands. An international exchange of experience has developed which is lifting the iron and steel industry to a much higher plane, expressed in better and more uniform quality of products, in enlarged and broadened range of uses, in a more complete utilization of raw materials, in the suppression of waste, in much improved working conditions of labor, and in more intelligent and, therefore, more satisfactory co-operation between buyer and seller. There is a much quicker recognition of the merits of improvements, which is best illustrated by the extraordinary rapidity with which the gas engine and the electrical drive have become well nigh universal.

### Germany's Economy of Fuel Against American Economy of Labor

Having invited the Congress to come to Germany, the hosts arranged for a splendidly complete series of papers detailing in nearly all the departments the technical progress made during the past decade in their own country. Naturally it reflects the peculiar conditions, some of which are characteristic of Germany as a whole, like the relatively low wages and the abundance and the high professional standard of the technical administrative and commercial staff. Other conditions differ in different parts of that country, like the cost of raw materials, the cost of assembling and marketing, so that emphasis is placed upon certain considerations in one section which are relegated to a more secondary position in others.

Fuel economy in all the districts, and in some sections, like Upper Silesia and the Saar district, the necessity to manufacture a moderately fair blast furnace coke from rather unpromising coal, have been among the chief problems of the German iron industry. The persistence and skill with which they have been solved are among the proudest achievements of German managers and engineers. For decades the indifference of American iron masters to the value of economics along the same lines was the marvel of unprejudiced observers, even after making due allowance for potent mitigating circumstances.

For a long time those who had wrestled with the problems of one country could not understand the seeming indifference to them of the producers in another. Twenty years ago our European friends came over, wondered at our labor-saving appliances and our craze for tonnage, went home and figured that with their cheap labor the costly appliances would not justify increased interest, sinking funds, and repairs, and that order books into which tonnage dribbled by hundreds of tons would not permit of installing plant which fed on blocks of thousands.

A Connellsville coke maker whose coal was costing him 50 to 60 cents a ton could see little inducement in building by-product ovens and costly recovery plant with uncertainties as to marketing by-products when his principal object was to double output at short notice in boom times and gather in additional coal acreage in times of depression.

### European and American Basic Conditions Approximating

But the tendency has been in recent years to so modify basic conditions on both sides of the Atlantic that the point of view of captains of industry has steadily approached. Wages have been rising in Germany, and the burdens of social legislation are adding to them more and more. Home consumption and foreign outlets have expanded so that the unit of output has grown larger, and "American" mills of relatively enormous capacity and cost no longer have any terrors.

We are rapidly adopting European methods of coking; we are looking after steam economy, even in Pittsburgh; we are well started in the introduction of the modern gas engine, and are in the front rank in applying the electric drive.

It almost looks, too, as though a condition which has long favored industrial undertakings abroad from our point of view may have some influence with us. In those countries in Europe in which 30 years ago the State required the railroads, capital accumulating has had no outlet in perfecting and extending the railroads and has been driven into industrial investment. While there is no public demand for State ownership of the railroads in this country, it does look as though a larger proportion than hitherto of our annual savings will seek employment in other directions, unless a more reasonable attitude toward the common carriers is made to prevail.

However, to me one striking fact, while watching technical and economic developments in the steel industry of the principal industrial countries, has been that methods and plants are becoming almost internationally uniform. The provincialisms, if I may so term them, due to exclusive attention to local conditions are disappearing, and he who could once return from a trip to a foreign country with swelling pride concerning great achievements at home and a somewhat languid interest in what was being accomplished elsewhere, must be content now with a relatively small and narrow budget of glorification and a pretty small array of items to justify posing as a reformer.

### German Progress in Coke Oven Design

Let me state at the outstart that the Düsseldorf Congress did not bring out any new developments sensational in their character; no new departures which might give promise of those revolutions in the steel industry of which we hear every day, but which really occur at such very rare intervals. No better illustration of how much patient and persistent effort and how much time is required to perfect a really revolutionary invention could be furnished than the splendid record of the basic Bessemer process in Germany. W. Esser's paper before the Congress is a brilliant presentation of the modern methods and should be studied by those who desire to appreciate

* Read at the New York meeting of the American Iron and Steel Institute, October 14, 1910.

wherein lies the strength of Germany's steel industry. I shall not follow him into details because the basic Bessemer process has never found a footing in our own country owing to the fact that our raw materials call for other methods.

During the past few decades the Germans have been the leaders in studying fuel economy and beginning with the first stage, the manufacture of coke, they have continued to make steady progress. A very elaborate paper before the Congress was that of Prof. Fr. Herbst, of Aix-la-Chapelle, on "Modern Coke Ovens and the Development of the Mechanical Appliances." Coke oven gas is being utilized more and more on the Continent to drive gas engines and is being employed also for heating open hearth furnaces. There has been a good deal of activity in utilizing coke oven gas for lighting, heating and power for communities and a very comprehensive scheme is being seriously considered to distribute power from a central plant to a number of Rheinish cities. The lead which we took in this country, of making gas the principal product with coke as an incidental, is being followed in Europe. With the many varied purposes, adaptation to them has been reflected in the design and operation of coke ovens.

The higher value of the surplus gas has given increased vogue to the oven types with regeneration, and one of the principal aims of coke oven builders has been to overcome the irregularity of heating in the regenerative ovens incident to the reversing. This is sought by a maximum division of the flues and more careful combustion, or by the plan of obviating the reversing altogether.

Herbst reviews in detail the betterments made in the Otto regenerative oven, in the Koppers and in the Collin. He refers to recent experience with the Kros oven which is being built by Salan & Birkholz of Essen. It has given encouraging results so far as mitigating the influence of reversing is concerned and has brought about a decrease in the time of coking from 44 to 28 hours. He reports on the new Coppee oven, on that of the Rheinische Chamotten und Dinas Werke and on the Ries inclined oven of the Stettiner Chamotte Fabrik.

Professor Herbst devotes a good deal of attention to recent improvements in stamping machines, noting among others the Méguin machine with electro magnetic lifting device. He deals also with charging and leveling machinery, with devices for getting rid of the gas during charging, with improved oven doors and discharging and quenching appliances.

### Flue Dust Briquetting

In the preparation of iron ore for the blast furnace, relatively little has been done thus far in Germany. Attention has been directed more particularly to briquetting flue dust. Prof. G. Franke, of Berlin, in a paper on the subject, estimates that 10 plants with a capacity of 700,000 tons per year handle over 500,000 tons of flue dust, leaving only a relatively small balance for ores. There are in operation the Schumacher chloride of magnesium process, the Tigler lime, the Trainer cell pitch methods, the Rónay high-pressure process and the Scoria process. Nodulizing has not attracted much attention.

### By-Product Recovery in Coking

There has been much earnest work in the direction of improving the methods of recovering the by-products in coking. A close analysis of this branch, bordering as it does on the chemical industry, was submitted by O. Rau, of Aix-la-Chapelle. Coke oven engineers who at first adopted methods borrowed from the field of illuminating gas manufacture have worked along lines aiming at a more direct adaptation to the conditions affecting the coking industry. The removal of the tar is based upon the fact that above 80 degrees Celsius, tar is in the gas in the form of a fog which needs only to be forced into the form of sufficiently large and heavy drops. This is effected either by the centrifugal method adopted by Brunck or by a tar jet used by Otto. It is a necessary preliminary for the direct sulphate process of recovering the ammonia in the coke oven gas introduced into practice on a large scale both by Otto and by Koppers, with highly satisfactory results as to increased yield and lowered costs.

Burkheiser separates the ammonia by sulphurous acid, utilizing the sulphuretted hydrogen in the oven gas and obtains a mixture of sulphate and sulphite of ammonia, which has made good records as a fertilizer. The question of marketing of the tar, benzole and ammonia is receiving eager attention, and there has been some uneasiness over the rapid expansion of the industry producing fixed nitrogen in various forms. Of the total production of coal in Germany during 1909, 76 per cent. was fired direct, 4 per cent. was coked without by-product recovery, 16 per cent. was coked with by-product recovery and 4 per cent. was used for the manufacture of illuminating gas with by-product recovery. In the United States 87 per cent. was fired direct, 10 per cent. was coked without recovery, 2 per cent. was coked with recovery, and 1 per cent. was manufactured into lighting gas with by-product recovery. Or, as Rau puts it rather significantly, Germany utilizes 20 per cent. of its coal rationally, while the United States so handles only 3 per cent.

### The Use of Blast Furnace Waste Gases

An important achievement of the past 10 years has been better utilization of the waste gas from blast furnaces, the principal phase of which has been the development of power. It was recognized soon after the introduction of the gas engine driven with blast furnace gas that cleaning of the gas was very important. Curt Grosse of Metz has collected for the Congress the latest information on the subject. How rapidly the appreciation of its value has spread may be realized from his estimate that now over 63 per cent. of all the gas coming from German blast furnaces is cleaned. Improvements in detail have been made in the coolers and automatic removal of the slimers has been worked out, but the main reliance is upon the mechanically operated apparatus of the Zschocke, Theisen, Bian and Schwarz types, the general plan followed being to remove the dust in two successive stages, the first to obtain gas suitable for the heating of stoves and for combustion under boilers, while the second aims at as thorough a cleaning as is possible for the gas for engine purposes. The tendency is to concentrate the whole apparatus, with the exception of the dust catchers, in one central plant where there are a number of blast furnaces.

Herr Grosse has collected data which show that the saving in coke through a gas cleaning plant varies from 20 to 55 kg. per ton of pig iron and that the temperature of the blast was increased from 60 to 100 degrees Celsius. The time required to heat the stoves was cut down nearly one half while the time during which the stoves could be kept on blast increased thirty minutes. When running on cleaned gas the stoves use about 42 to 44 per cent. of the furnace gas. Adding 16 to 18 per cent. for the other requirements of the furnace there would be available about 37 to 42 per cent. for steel works and rolling mills and for any other outside uses. The life of the hot blast stoves is longer, but it must be taken into consideration that since the cooled and cleaned gas has a considerably higher calorific power and needs a longer path the stoves must be considerably higher. Recently stoves up to 40 meters (125 ft.) in hight have been built.

### The Advance in Basic Open Hearth Practice

The open hearth process has been making rapid progress in Europe, and notably so in Germany, and

several papers were brought forward before the Congress, the most comprehensive being that of R. Genzmer, of Julienhuette, Upper Silesia. He deals more particularly with the pig and ore process, which has made headway so rapidly since the use of direct metal, and is conquering a place in Germany in competition with the basic Bessemer, on irons carrying a relatively high percentage of phosphorus. The mixer is playing a more and more important part, there being a growing tendency to utilize it for preliminary refining, particularly when the mixer is well heated. Additions of ore and of lime are employed to practically get rid of the silicon, while sulphur is reduced by about one-half.

At the Georgs Marienhuette at Osnabrueck a 150-ton mixer, heated with blast furnace gas, is used; a second 250-ton mixer being under construction, which together will then serve three 50-ton open hearth furnaces, there being five in all. About 5 to 6 per cent. of ore and 3 to 4 per cent. of lime are added, the iron carrying 3.80 per cent. of carbon, 2.75 per cent. of manganese, 0.4 per cent. of phosphorus, 0.6 per cent. of silicon, 0.05 per cent. of sulphur and 0.4 per cent. of copper. The iron delivered by the mixer contains 3.50 per cent. of carbon, 1.2 per cent. of manganese, 0.08 per cent. of silicon, 0.15 per cent. of phosphorus and 0.02 per cent. of sulphur. Using 70 per cent. pig and 30 per cent. scrap, the addition of ore in the open hearth is 16 to 17 per cent., of whose iron contents 83 per cent. is recovered. It is expected that when the second mixer is in operation it will be possible to produce with these open hearth furnaces about 800 to 850 tons of steel per day. Labor has been decreased, the consumption of lime, dolmite and ore have been lessened, and the yield in good ingots has been 103 to 104 per cent. The consumption of coal for the open hearth furnaces using the Kerpely producer has been 16.3 per cent.

An interesting recent development has been the introduction of the Hoesch process, a modification of the Bertrand Thiel process, which has been elaborately reported on recently by Dr. Springorum. It is in operation at Hoesch and at Hoerde and is being installed at Friedenshuette and at Koenigshuette in Upper Silesia. The process is the outgrowth of work done under the Bertrand Thiel method at Hoerde, where it was found, however, that in consequence of the low temperature and the heavy lime additions in the primary furnace there were large accretions, while the high temperatures in the fiinshing furnace caused the latter to suffer rapidly. It was decided therefore to work in one furnace, the method being the following: After the furnace has been charged with lime and ore the liquid metal is added and the reaction starts at once. After it has ceased to boil and is sufficiently hot, the charge is tapped with a ladle and the slag is easily poured off. After again charging the furnace with lime, ore and scrap, the metal is again poured into the furnace. The finishing takes only a short time because the fresh slag acts rapidly and the charge is quickly brought up to the highest temperature.

At Hoerde the iron is taken from the same mixer which supplies the basic Bessemer plant, and contains about 1.85 per cent. of phosphorus, 1 to 1.50 per cent. of manganese, 0.25 to 0.60 per cent. of silicon and 0.1 to 0.15 per cent. of sulphur. In the first heat the phosphorus is brought down to 0.1 to 0.3 per cent., and what is extremely important, the slag which is produced carries from 20 to 26 per cent. of phosphoric acid, of which 80 to 90 per cent. is soluble as citrate, so that it is readily marketable for fertilizing purposes. The yield of phosporic slag is 12.6 per cent. of the weight of the ingots. During the fiscal year 1908-1909 there were charged 48,463 tons of material, exclusive of ore, consisting of 74.72 per cent. of pig iron, 0.25 per cent. of Speigeleisen, 0.48 per cent. of ferromanganese, 0.02 per cent. of ferrosilicon, 0.17 per cent. of scrap iron and 24 per cent. of steel scrap. The yield was 50,606 tons of ingots or 104.42 per cent. There was also charged 11,011 tons of ores and mill cinder, the yield being 93 per cent. of its iron contents. The average analysis of the steel was 0.07 per cent. of carbon, 0.02 per cent. of phosphorus, 0.44 per cent. of manganese, and 0.055 per cent. of sulphur. The cost is equal to that of a basic Bessemer plant with basic pig at 53 marks a ton, on the basis of 30-ton open hearth furnaces. With larger furnaces it would probably be lower. With higher prices of basic pig, the Hoesch process would gain relatively.

On the electro metallurgy of steel there was only one paper at Düsseldorf which went over much trodden ground and did not bring out any discussion. Two modern plants, however, were accessible to the delegates—the Lindenberg at Remscheid and the Becker.

Those who have been accustomed to hear the death-knell rung of the puddling furnace in former years, will hesitate now to bid farewell to the crucible. With its high temperatures and its reducing atmosphere the electric furnace has made available means for the certain production of steel of high quality, chemically and structurally, which will prove of splendid service to many industries.

## Manufactures Now More Than Half Our Exports

Manufactures now form, for the first time in the history of the country's commerce, more than one half of the total exports of the United States. In the eight months ending with August the figures of the Bureau of Statistics of the Department of Commerce and Labor show that out of a total exportation of $1,027,000,000 manufactures amounted to $542,750,000, or 52.8 per cent. of the whole.

One year ago, out of a total export of $989,000,000 in the eight months, manufactures contributed $475,000,000, or but 48 per cent.; two years ago their share was $472,000,000, out of a total of $1,075,000,000, or 44 per cent. of the total; 10 years ago, taking the figures for the entire year, manufactures formed 35½ per cent.; 20 years ago, 21 per cent. and 30 years ago, 15 per cent. of the total exports of domestic merchandise.

These increases in values of manufactures exported are, it is proper to add, the result, in most cases, at least, of increased quantities of merchandise exported and not the result of higher prices, since, as shown by a statement recently issued by the Bureau of Statistics, prices of both exports and imports show a downward tendency in recent months.

**The Modern Water Supply Company.**—This company has moved from the German National Bank Building to a storeroom at 210 Wood street, Pittsburgh. It has on display various types of water system for city, suburban, country or small town homes, hotels or factories; also electric lighting plants and gas and gasoline engines. In one window, in a glass cylinder, a Perry pneumatic pump works continuously, the compressor being driven by a motor automatically controlled, so that when the air pressure falls to a certain point the motor starts, pumps the pressure up to a predetermined point and cuts out. On one side of the room the Modern hydro-pneumatic water systems are demonstrated. A gas engine, deep and shallow well pump, a hot air engine and hand pump are all connected to a pressure tank and can be started up to show how each one works. On the other side of the room is a complete electric light plant driven by a gas engine that can supply the office with lights and run the motor for the air compressor. The company is sales agent for the Perry pneumatic water systems, the Fairbanks-Morse gas and gasoline engines, the Rider-Ericsson hot air engines, the Standard pumping engines and the Sanitary Pump Company.

# Black Plate, Tin Plate and Terne Plate Production in 1909

The production of black plates, or sheets, for tinning, and the production of tin plates and terne plates in the United States in the calendar year 1909 have been compiled by the American Iron and Steel Association.

*Black Plates, or Sheets, for Tinning.*—The production of black plates, or sheets, for tinning in 1909 amounted to 606,844 gross tons, against 513,771 tons in 1908, an increase of 93,073 tons, or over 18.1 per cent. The production in 1909 was much the largest in our history. The year of next largest production was 1906. The following table gives the production by States in the last three years in gross tons:

| States.—Gross tons. | 1907. | 1908. | 1909. |
|---|---|---|---|
| Pennsylvania | 253,807 | 278,163 | 309,344 |
| Maryland and West Virginia | 95,939 | 92,860 | 115,866 |
| Ohio, Indiana and Illinois | 154,326 | 142,748 | 181,634 |
| Totals | 504,072 | 513,771 | 606,844 |

Of the total production in 1909, about 4261 tons were rolled from iron and about 602,583 tons were rolled from steel, while in 1908 about 2954 tons were rolled from iron and about 510,817 tons from steel. In 1907 about 3161 tons were rolled from iron and about 500,911 tons from steel. In 1909 there were 31 active black plate works, as compared with 28 in 1908 and 31 in 1907. The number of idle black plate works in 1909 was 9, as compared with 13 in 1908 and 10 in 1907.

The following table gives the production of black plates, or sheets, for tinning in the United States from 1894 to 1909. Prior to 1894 the statistics of the production of black plates, or sheets, for tinning were not separately classified:

| Years. | Gross tons. | Years. | Gross tons. | Years. | Gross tons. |
|---|---|---|---|---|---|
| 1894 | 52,359 | 1900 | 315,000 | 1906 | 576,079 |
| 1895 | 129,615 | 1901 | 398,026 | 1907 | 504,072 |
| 1896 | 185,387 | 1902 | 365,743 | 1908 | 513,771 |
| 1897 | 271,886 | 1903 | 490,652 | 1909 | 606,844 |
| 1898 | 345,254 | 1904 | 472,569 | ... | ... |
| 1899 | 375,000 | 1905 | 507,587 | ... | ... |

*Tin Plates and Terne Plates.*—We estimate the production of tin plates and terne plates in 1909 as amounting to 1,373,011,000 lb., or 612,951 gross tons, as compared with 1,203,075,000 lb., or 537,087 tons, in 1908, an increase of 169,936,000 lb., or 75,864 tons. Of the total in 1909, 1,182,081,000 lb. were tin plates, as compared with 1,048,896,000 lb. in 1908, an increase of 133,185,000 lb., and 190,930,000 lb. were terne plates, as compared with 154,179,000 lb. in 1908, an increase of 36,751,000 lb. The following table gives the production by States in 1909; also the total production in the three previous years:

| States.—Pounds. | Tin plates. | Terne plates. | Total. |
|---|---|---|---|
| Pennsylvania | 671,003,000 | 48,756,000 | 719,759,000 |
| New York and West Virginia | 179,130,000 | 62,431,000 | 241,561,000 |
| Ohio, Indiana, Illinois and Michigan | 331,948,000 | 79,743,000 | 411,691,000 |
| Totals for 1909 | 1,182,081,000 | 190,930,000 | 1,373,011,000 |
| Totals for 1908 | 1,048,896,000 | 154,179,000 | 1,203,075,000 |
| Totals for 1907 | 996,650,000 | 156,447,000 | 1,153,097,000 |
| Totals for 1906 | 1,100,373,000 | 193,367,000 | 1,293,740,000 |

Combining tin plates and terne plates, Pennsylvania made over 52.4 per cent. of the total in 1909, against over 54.6 per cent. in 1908. All the tin plates produced in 1909 were made of steel, but of the 190,930,000 lb. of terne plates about 8,054,900 lb. were made of iron and about 182,875,100 lb. were made of steel, as compared with about 6,560,500 lb. of iron and about 147,618,500 lb. of steel terne plates in 1908. In 1909 the iron terne plates were made in Pennsylvania, Ohio and West Virginia. About 26,628,000 lb. of the tin plates made in 1909 were consumed by the makers in the manufacture of stamped ware, against about 26,217,000 lb. in 1908. In addition to tin and terne plates small quantities of pure lead coated and aluminum coated steel sheets for special roofing purposes were produced in both 1908 and 1909.

The number of active plants in 1909 was 34 and the number of idle plants was 11.

# The National Machine Tool Builders' Association

The programme for the ninth annual meeting of the National Machine Tool Builders' Association, which is to be held at the Hotel Astor, New York, October 25 and 26, has been issued. The first session, on the mornning of the 25th, will be given up to routine matters, such as the enrollment of new members, selection of convention committees, call for resolutions and reports of officers.

Reports will be received from standing committees, as follows: Patent Committee, C. L. Taylor, chairman; Committee on Revision of Constitution, A. H. Tuechter, chairman; Apprenticeship Committee, E. P. Bullard, Jr., chairman; Cancellation of Orders, also Dealers' Commissions Committee, C. Wood Walter, chairman.

The afternoon of the same day has been set aside for meetings of the several section committees.

On the morning of the second day papers will be read and addresses made as follows:

"Who Should Pay the Expenses of a Representative from the Factory When Sent Out at Request of the Dealer to Help Close a Deal?" by F. L. Eberhardt, Gould & Eberhardt, Newark, N. J., and C. H. Norton, Norton Grinding Company, Worcester, Mass.

"The Use of Ball or Roller Bearings in Machine Tool Construction," by Henry Hess, Hess-Bright Mfg. Company, Philadelphia, Pa.

"Advertising—Large Space in a Few Papers *vs.* Small Space in a Number of Papers," by Thomas H. Moore, advertising manager, John Wanamaker, Philadelphia, Pa.

"Concrete *vs.* Wood Flooring," by James N. Heald, Heald Machine Company, Worcester, Mass.

The afternoon session will open with addresses on "The Design and Construction of Machine Tools from the User's Standpoint," by C. K. Lassiter, mechanical superintendent, American Locomotive Company, and John Riddell, General Electric Company, Schenectady, N. Y.

Reports of convention committees will then be received, followed by the report of the Nominating Committee, election of officers and selection of the place of the next convention.

A striking commentary upon the work accomplished during the year is the increase of membership, the result of the unremitting efforts of Secretary Charles E. Hildreth. The programme gives a list of 17 applicants for membership, who are in addition to those admitted at the Rochester convention last spring. The new list follows:

**Acme Machine Tool Company, Cincinnati, Ohio.**
**Blanchard Machine Company, Cambridge, Mass.**
**Blount, J. G., Company, Everett, Mass.**
**Cleveland Planer Works, Cleveland, Ohio.**
**Fay Machine Tool Company, Philadelphia, Pa.**
**Frontier Iron Works, Buffalo, N. Y.**
**Gardner Machine Company, Beloit, Wis.**
**Gleason Works, Rochester, N. Y.**
**Grant & Wood Mfg. Company, Detroit, Mich.**
**Knight, W. B., Mfg. Company, St. Louis, Mo.**
**Lapointe Machine Tool Company, Hudson, Mass.**
**Lea Equipment Company, New York City.**
**Lees-Bradner Company, Cleveland, Ohio.**
**Morse Twist Drill & Machine Company, New Bedford, Mass.**
**National Machine Company, Hartford, Conn.**
**Ransom Mfg. Company, Oshkosh, Wis.**
**Robbins Machine Company, Worcester, Mass.**

**Holland is arranging to abandon free trade. The Minister of Finance is expected to bring forward a tariff for ratification by Parliament.**

# The Hawley Automatic Annealing Furnace

## A Recent Model in Which Electric Motors Control All Operations

A new type of annealing furnace has been recently perfected by the Hawley Down Draft Furnace Company, 736 West Monroe street, Chicago, Ill., which is the invention of Cliff Bleyer, its general manager. The remarkable feature of this furnace is that its entire operation is automatic, the mechanical work being performed by electric motors, which are controlled by a clock, so that each charge of castings is retained in the furnace for the length of time required by the character of the work. A furnace of this character is

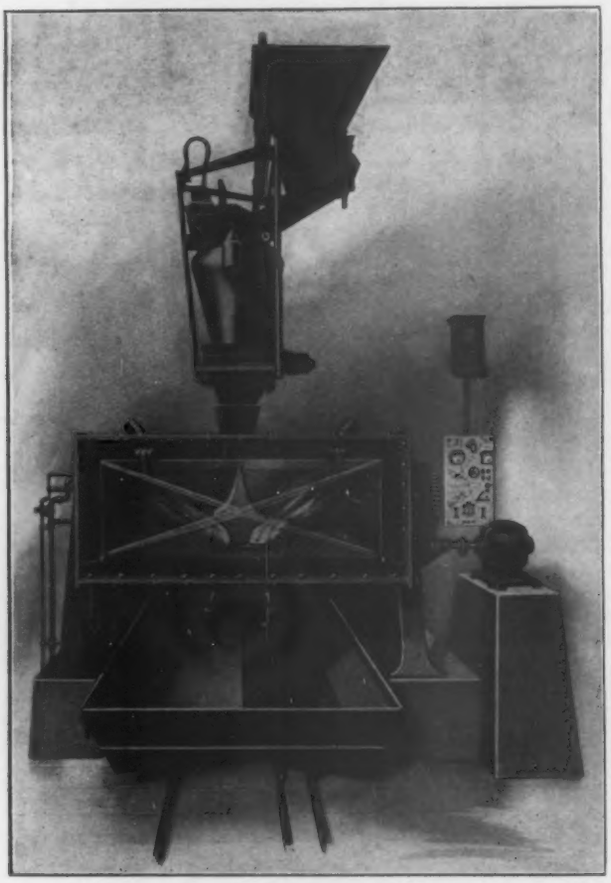


Fig. 1.—General View of an Automatic Annealing Furnace, Designed by the Hawley Down Draft Furnace Company, Chicago, Ill.

especially adapted for light castings, like cartridge shells, which must be handled economically in large quantities, but is also suited for any kind of small gray iron or metal castings requiring a short annealing period. The charge is automatically weighed into the furnace, discharged by a tilting movement, and the truck which carries the annealed castings away operates automatically on a track, discharging its load at any point for which the mechanism may be adjusted and returning to its station under the furnace. Fig. 1 is a general view of the plant and Fig. 2 shows the furnace tilted to discharge its load.

The furnace is fed from an overhead hopper of sufficient capacity to keep the plant in continuous operation. The material may be conveyed to it by any desired means, but in one plant where the system is being installed the tumbling barrels in the foundry discharge the castings directly on a belt conveyor, which carries them to the hopper. From the hopper the castings are weighed by an automatic scale, which can be adjusted to weigh charges in any amount from 50 to 500 lb. The movements of this scale are synchronized with those of the furnace through a connection with the electric clock, and a fresh charge may be dropped into the furnace immediately after the succeeding lot of castings has been discharged or an interval may be allowed to recover any heat which may have been lost by the discharging movement of the furnace. The mechanism of the automatic scale is of the standard type for automatic weighing and has been adopted in this system of automatic annealing, as the charge can be regulated to the amount best suited to the capacity of the furnace and the character of the material to be annealed. The castings drop from the hopper into the scale and from the latter to the furnace by a sliding movement, the pitch of the slide being adapted to the character of the material handled, so that the castings are not damaged by a direct drop.

Its mechanical operation is the principal novel feature of the furnace. It is heated by two fuel oil burners of the type used in metal melting furnaces, as it has been found that these will maintain a constant temperature within the required range, especially if strained oil is used. It is said that once the proper heat has been attained in starting the furnace no further attention is required except an inspection every 8 or 10 hours. The flame enters the bottom of the furnace, but is deflected, as shown in Fig. 1, toward the outlet, so that it does not come in contact with the castings.

Six heavy cast iron plates bolted together form the oblong shell of the furnace proper, which is lined with from 4 to 8 in. of firebrick, according to the capacity of the furnace. An interlining of asbestos varying in thickness from ½ to ⅞ in. is interposed between the shell and the firebrick lining, and serves to retain the heat and keep the annealing room cool. The furnace is swung on two cast steel trunnions similar in design to those employed on the company's tilting metal melting furnaces. The tilting of the furnace is accomplished by gears operated by two electric motors both of which are controlled by the electric clock shown at the right of Fig. 1. One of the motors controls the discharging movement of the furnace, and its return to the loading position through an arc of 90 degrees. The other tilts the furnace backward and forward through an arc of 45 degrees and turns the castings. This movement secures a uniform heat treatment for the castings on all sides by changing their position in the furnace and their points of contact with each other. The control of this motor by the electric clock makes it possible to turn the castings once in the middle of the heat and at such other intervals as may be suited to the character of the work.

The wedge-shaped brick projecting upward from the bottom of the furnace at the center is another ingenious feature. As will be noticed from Fig. 1, the face of this brick is curved, its purpose being to act as a slide to break the fall of the castings when a charge is dropped into the furnace. This is accomplished by the curved face of the brick, which arrests the descending movement of the charge slowly, so that the castings are deposited in the furnace without any sudden jar which would cause breakage or damage. This brick also serves as a flame deflector to protect the castings from direct contact with the flame, and is one of the patented features of the furnace. In common with the lining of the furnace it is subject to wear, but it is inexpensive and can be easily replaced. The furnace lining is designed according to the character of the work to be handled, and in the case of small castings they are evenly spaced on the floor of the furnace.

The automatic motor operated truck which carries away the annealed castings has a hopper shaped car mounted upon it to receive the material from the furnace. This motor is so wired that the truck can travel automatically any required distance to deposit the castings at the point where further operations are

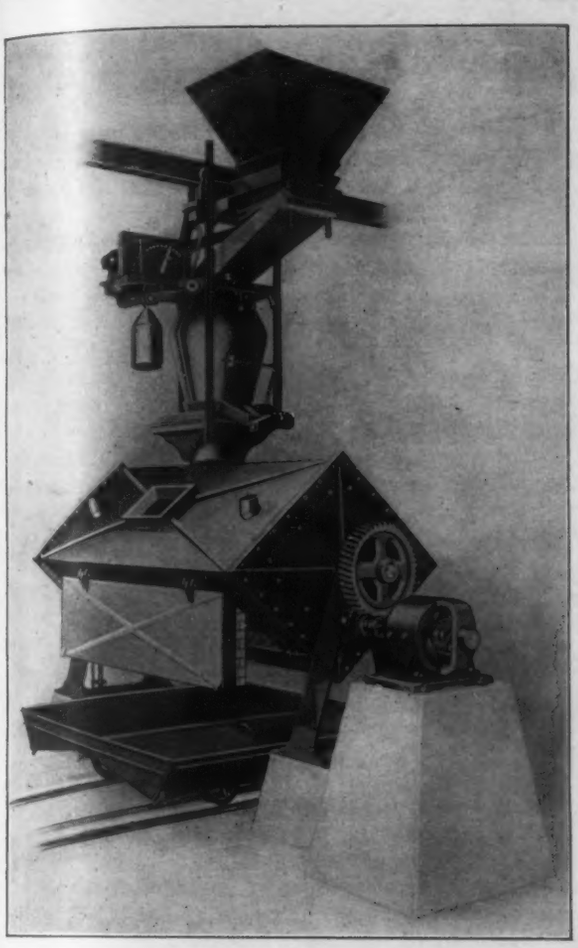


Fig. 2.—The Furnace Tilted to Discharge Its Load of Castings.

to be carried on. The truck drops its charge automatically on either side of the track at the desired point, and at the same time this discharging movement reverses the motor and carries the truck back to its original position under the furnace.

The electric clock is of the standard design employed for controlling the movements of automatic machinery, and either the minute or the hour hand may be used to close the circuits by making contact with a set of plugs placed in the face of the clock. Where the character of the castings is such that an annealing period of less than an hour is required the minute hand is used, but if a longer period is necessary the series of plugs are designed to make contact with the hour hand. This clock is the master key of the entire system of mechanism connected with the operation of the furnace.

If the annealing period is 30 min. for each charge, the sequence of operations would be as follows: The two oil burners which heat the furnace would be started and the proper annealing heat secured. If the furnace was ready for the first charge at 9 a.m., the first plug in the series would be set to make contact with the minute hand at that time. This closes the circuit controlling the automatic scale, which weighs the amount of castings for which it has been adjusted from the hopper and drops the charge into the furnace. At 9.15 the minute hand makes contact with the second plug, which operates the tilting motor, and the furnace is moved forward and backward through an angle of 45 degrees on either side of the vertical, and the castings are turned to make the annealing process uniform. Fifteen minutes later, or at 9.30, when the annealing of the charge has been completed, the minute hand makes contact with the next plug, which closes the circuit controlling the motor for discharging the furnace. This tilts the furnace to an angle of 90 degrees, which releases two cams on the front door of the furnace, permitting it to open and drop the charge on the truck, as shown in Fig. 2. The action of the furnace in returning to its original position after discharging the castings closes the truck motor circuit and sends it on its journey with the annealed castings. A short interval is required by the furnace to recover the heat lost by opening the door and discharging its burden, and a very satisfactory way of regulating this is to hold the furnace empty until the truck has returned. When it resumes its position under the furnace the circuit operating the automatic scale is closed and the furnace recharged. This series of operations is repeated continuously day and night until the firebrick lining requires renewal.

The counter register shown in Fig. 2 in front of the hopper is attached to the automatic scale, so that every charge weighed into the furnace is recorded and the amount of material that is passed through the furnace is shown at any time. This serves as a check on the foundry and finishing departments and also gives an exact record of the amount of material handled. Although an occasional inspection, every 8 or 10 hours, is sufficient to keep the temperature of the furnace uniform, an electric thermometer is wired to show the temperature of the interior of each furnace in a plant at all times. To facilitate the supervision of a plant where several furnaces are in operation these and other recording devices are placed in the superintendent's office.

**The Chester Steel Casting Company's Improvements.**—The Chester Steel Casting Company, Chester, Pa., is making extensive improvements to its annealing department in connection with its manufacture of cementation steel. Considerable betterments have been made in this department from time to time, both in the way of simplifying the method of manufacture and systematizing the course of production. With the improvements now about completed, this company will be enabled to make deliveries on cementation steel of high quality in about one-half the time previously required. In connection with the manufacture of general steel castings, the company has evolved a system of microscopical tests, of which photographic reproductions showing various grades of steel castings are being distributed to its customers. By a special system of shop management, the progress of work under way is followed from day to day, and thus more accuracy in delivery dates is possible.

The Association of Iron and Steel Electrical Engineers will hold its annual convention in Hotel Schenley, Pittsburgh, October 17 to 20. A day and a half of the convention will be devoted to the discussion of safety devices and methods of prevention of accidents. A lecture will be given on the subject of "Safety" by Dr. W. H. Tolman, director American Museum of Safety, at the Carnegie Institute, Pittsburgh, on the evening of October 18. The Standardization Committee, of which L. R. Palmer, Jones & Laughlin Steel Company, is chairman, has in hand a standard crane specification. The officers of the association are as follows: F. P. Townsend, National Tube Company, president; L. R. Palmer, Jones & Laughlin Steel Company, first vice-president; P. D. Brown, Carnegie Steel Company, second vice-president; E. W. Yearnsley, Midvale Steel Company, treasurer; James Farrington, La Belle Iron Works, secretary.

The Empire Iron & Steel Company, Niles, Ohio, now has the exclusive sale of the Griffiths galvanized charcoal iron sheets, made by the Griffiths Charcoal Iron Mills, Washington, Pa. It will carry a complete stock of merchant sizes and will be able to furnish promptly to the trade genuine iron tin plate, such as has been used very largely by the Government on post-office buildings throughout the country.

# American Boiler Manufacturers' Association

## Twenty-second Annual Convention, Chicago, October 10 to 13

The twenty-second annual convention of the American Boiler Manufacturers' Association was held at the Auditorium Hotel, Chicago, October 10, 11, 12 and 13. The attendance was large for this organization, comprising boiler manufacturers from all parts of the country, as well as from Canada, and representatives of manufacturers of boiler makers' supplies, many of whom were accompanied by ladies. Among visitors and guests of honor were Gen. George Uhler, supervising inspector general, Steamboat Inspection Service, Washington, D. C.; Joseph McNeill, chief inspector and chairman Board of Boiler Rules, Boston, Mass.; Arthur E. Brown, representative of the International Association of Master Boiler Makers, Louisville, Ky., and Capt. Harold P. Norton, United States Navy.

### MONDAY'S SESSIONS

President E. D. Meier called the convention to order. The address of welcome to the city of Chicago, in the absence of Mayor Busse, was made by Assistant Corporation Counsel George M. Bagby, who talked entertainingly and departed widely from the stereotyped speech on such occasions, incidentally suggesting that the boiler manufacturers' turn their attention to the task of abating the smoke nuisance which afflicts Chicago, St. Louis, Cincinnati, Pittsburgh and other cities. He was replied to by President Meier, who conceded to Chicago everything of pre-eminence she claims, and in regard to the smoke abatement said that it is unfortunate that the cities named use a fuel which not only contains much smoke to the pound of coal, but requires by reason of its lesser content of British thermal unit more pounds to be burned under the boilers to produce the same efficiency than the coal used in the Eastern sections of the country. The convention went into executive session for the remainder of the morning.

In the afternoon the open meeting was resumed. The following were admitted to membership: G. A. Schust, Fort Wayne, Ind.; Wholey Boiler Works, Providence, R. I.; F. G. Fernstrum, Menominee Boiler Works, Menominee, Mich.; John Nooter Boiler Works Company, St. Louis, Mo.; Missouri Boiler Works Company, Kansas City, Kan.

Andrew Jack of Manistee, Mich., was introduced to the convention as the oldest living boiler maker in the country. He displayed an old invoice showing purchases by him of boiler plate at 9 cents a pound of Joseph T. Ryerson, Chicago, in November, 1868.

For the information of the convention Mr. McNeill stated that the Massachusetts Board of Boiler Rules is constituted as follows:

> The chief inspector of the boiler inspection department of the district police, who shall be its chairman; one member representing the boiler using interests; one member representing the boiler manufacturing interests; one member representing the boiler insurance interests; and one member who is an operating engineer.

The usual committees were appointed, after which a communication was read from E. Leonard & Sons, London, Canada, urging the association to take steps toward the standardization of boilers. In the discussion which followed it was generally conceded that standardization is becoming a necessity, as it has been found to be in various other lines. Messrs. Ryan, Ashley and Riley were named as a committee to investigate and report on this subject.

### Topical Questions Discussed

The chairman of the Committee on Topical Questions made a report submitting a number for discussion, to which the remainder of the session was devoted. Among those presented by the committee and discussed were the following:

> If boards or commissions of boiler rules are created, should the majority of its members consist of engineers or boilermakers?

This was fully discussed, and the association members decided that they considered boiler manufacturers better fitted to perform such duties than engineers, who had not had practical knowledge of making boilers, and that in any event the majority of the members of such boards or commissions should be practical boilermakers and engineers.

> Should the details of manufacture of boilers be regulated by such boards?

The consensus of opinion was that necessarily such must be the case. The details must be fixed and standardized.

> Does any other line of manufacture specify so minutely the methods of workmanship and quality, quantity and locality of materials?

This again is a growing necessity of modern industrial conditions and follows a necessary sequence from the establishment of certain standards which are considered in the previous question. Where it is not undertaken and carried out by government boards or commissions it is done by voluntary associations of manufacturers of the same class and type of goods.

> Does "public safety" depend upon destroying the right of a manufacturer to build a good boiler in his own reputable way, knowing that it is the equal, at least, of a boiler prescribed by a commission?

This question was admitted, as were the prior ones, as illustrating a type of objections to the board or commission plan that have to be explained and met. It was satisfactorily answered by quoting from the Massachusetts law approved May 14, 1909, as follows:

> Section 26. . . . When a person desires to manufacture a special type of boiler the design of which is not covered by the rules formulated by the Board of Boiler Rules, he shall submit drawings and specifications of such boiler to said board, which, if it approves, shall permit the construction of the same.

> What changes, if any, should be made in the Massachusetts Boiler Rules?

After considering this question, the conclusion was that such inquiry can only be answered by any one who is interested in it bringing up specific questions. This association is not aware of any necessary changes, but is prepared to take up any special questions when they arise.

Mr. Ashley of the Muskegon Boiler Works said that last summer when at Edmonton, in Alberta, making boiler drawings for his company, he had occasion to discuss various provisions of the provincial boiler rules as compared with some rules on this side of the line, and the provincial inspectors took exception to the Massachusetts rules, in respect to giving a fixed distance from the flange of the head and from the top row of boiler tubes to the rear to be braced on the heads of horizontal tubular boilers. Their own rules give a formula for computing these distances, and they contended that it was not right to give fixed dimensions, as these respective distances would vary according to thickness of head used, the pressure for which the boiler is to be constructed, &c. It seemed to Mr. Ashley that this point was well taken, as the distances in question can be expressed by a simple formula and computed easily, as, for instance, staybolt bracing, and that the Massachusetts rules would conform more to theory and be nearer correct in practice by having these dimensions computed instead of giving fixed dimensions to cover all cases.

Is it difficult to make caulking tight where the bevel shear is used?

It was generally agreed that it is not more difficult to do so than with the use of planers, provided the material used is right, the shears are kept sharp as they should be, and the work is well laid out.

## TUESDAY'S SESSIONS

The Committee on Place of Next Meeting, 1911, through M. A. Ryan, chairman, reported in favor of Boston, Mass., and the convention accordingly selected that city.

The report of the Nominating Committee was submitted by its chairman, James Lappan, recommending the re-election of the present officers. The report was adopted and officers re-elected accordingly, as follows:

President, E. D. Meier, New York, N. Y.; secretary, J. D. Farasey, Cleveland, Ohio; treasurer, Joseph F. Wangler, St. Louis, Mo.; first vice-president, T. M. Rees, Pittsburgh, Pa.; second vice-president, J. Don Smith, Charleston, S. C.; third vice-president, W. A. Brunner, Phillipsburg, N. J.; fourth vice-president, H. D. MacKinnon, Bay City, Mich.; fifth vice-president, M. A. Ryan, Duluth, Minn.

Arthur E. Brown, special representative from the International Association of Master Boilermakers, briefly reviewed the progress of the boilermaking industry, and the vastly increased efficiencies of the present as compared with past times, especially in locomotive boilers, and marine engines on the ocean liners, and reminded his hearers that the objects of the two associations, his own and the American Boilermakers' Association are kindred inasmuch as both seek for the betterment of materials and processes and workmanship, and expressed the hope for a closer affiliation of the two bodies.

Gen. George Uhler spoke of the important work of the Board of Supervising Inspectors, of the benefit derived from suggestions of boiler manufacturers and of the formulation of specifications for boiler plate, which had been persisted in by the board notwithstanding objections from plate makers. He feels assured that to-day the Department of Commerce and Labor is getting the best boiler plate that is made in the world in marine boilers, and he believed it is also the case with land boilers. With all precautions taken, some irregularities will creep in at times, as perfection cannot ever be expected in human affairs, but the board had taken all reasonable precautions to get the best material.

Regarding the relative merits of the spring pop safety valve and the lever type, General Uhler said that while the board had held varying opinions on this subject, yet the majority had decided that the old lever type safety valve is an efficient and satisfactory type of valve for smooth water practice. In reply to an inquiry by Captain Rees, he said that according to existing law the only value that can be allowed to-day for a triple riveted butt strap joint, of whatever gauge or thickness of material, is the value that is allowed by that section of the law that provides that the triple riveted shall be given 20 per cent. additional to the single riveted joint. No greater value is allowed for triple riveted or quadruple riveted than for double riveted with the holes punched. This has been brought to the attention of the proper authorities, but will require an enactment by Congress before any change can be effected in the law. Until changed the board has no discretion in the matter but must execute the law as it is.

General Uhler referred to the fact that Charles Lukens had brought to the attention of the department the imperfect results arising from certain methods of testing by coupons taken from the edge of the plate, illustrating it by a diagram, which the members of the board felt had given them valuable information, as it was most desirable to get accurate results as to the value of a plate.

### Abrogation of Agreement with Plate Makers

President Meier called attention to the fact that after the consummation of the joint agreement of December 15, 1905, between the American Steel Plate Association and the American Boiler Manufacturers' Association there had been manifested on occasions persistent activity on the part of individual members of the Steel Plate Association although not by the Association itself, which tended to devitalize that agreement, by such members making different specifications and arguing for them, notably in the American Society of Testing Materials, resulting in that society raising the limit of sulphur and phosphorus in flange steel. It had, therefore, by resolution of the American Boiler Manufacturers' Association adopted at Detroit, 1909, been determined to abrogate the agreement of December 15, 1905, relating to the percentage of sulphur and phosphorus in steel plates intended for use in steam boilers and return to the original American Boiler Manufacturers' Association specifications of 1889, which fix 0.03 per cent. maximum for sulphur and 0.04 per cent. maximum for phosphorus.

Due to delay in receiving the official copy of the above resolution of the Detroit convention, the American Steel Plate Association had not yet been notified of the abrogation of the December 15, 1905, agreement as referred to, but such action would now be taken.

### Boiler Explosions

The following questions relating to causes of boiler explosions were discussed:

Do you know of boilers having ruptured or exploded under 15 years of service, where the cause was due primarily to design, faulty material, or poor workmanship?

Are not the great majority of explosions (except where the cause is fully known) due to frequent expansion and contraction in order to clean and repair, extending over a period of more than 15 years?

Will not rules for inspection, proper methods of cooling, cleaning and reheating boilers, decrease explosions in a greater ration than rules for the manufacture?

Joseph H. McNeill stated that while in many cases the boiler explosions resulted from a combination of conditions, which included material, workmanship, operation, care and maintenance, yet there is no question that individual cases of boiler explosions could be instanced which had resulted directly from faulty construction. He cited as an illustration a case where the shell plate fractured at the longitudinal joints, the boiler being of double butt strap, triple riveted construction. The fracture in this case extended between the rivet holes in the outer row, and careful investigation showed that the shell of the boiler at the joint did not conform to a true circle; also, the rivet holes had been punched almost full size, and in addition to the portion of the plate which fractured clear through incipient cracks were found at the rivet extending longitudinally with the boiler. He said that the prevention of steam boiler explosions is a general proposition, in which the owner of the steam boiler, as well as the manufacturer and the engineer in charge, must all contribute their quota of care in their various lines, which can only be done by united effort, as expressed and carried out by proper legal enactment.

### Boiler Tubes Criticised

Charles S. Blake, secretary of the Hartford Steam Boiler Inspection & Insurance Company, stated that he thought the responsibility for explosions should be shared between boiler manufacturers, engineers and owners. He remarked incidentally that the manufacturers of tubes do not seem to be keeping up with the progress made by the manufacturers of other material entering into boiler construction. Higher pressures are being carried to-day than ever before, and the

tubes have not kept pace with the march of improvement. Twenty-five years ago the average pressures ran from 80 to 100 lb., and the tubes in use at that time were identical in thickness, except in specific instances, with those in use to-day for pressures of 150 to 175 lb., and the average quality has not improved, so that the standard commercial tube of to-day is no better than, if as good as, the tube of those days. Tubes should be stamped so that their source of origin could be located and the responsibility laid where it belongs when a casualty occurs through tube ruptures due to defect in manufacture. Tube failures are wofully common. Theoretically, a tube will stand a greater internal pressure than external, but as a matter of practice a tube which is subjected to internal pressure more commonly fails than in the tube subjected to external pressure. If the tube is defective in weld, with external pressure the tendency is to close the opening; with internal pressure the tendency is to open it. He thought the great trouble with tubes was not so much in the material as in the imperfect welding. He believed that more boilers explode under 15 years' use than over that period.

Colonel Meier told of a case in his experience where rupture of tubes had grown to be a chronic source of complaint at one plant, and he sent a man in quietly to see what he could learn as to the cause, and it was found that the engineer desiring to cool down quickly had been in the habit of throwing open the fire doors and suddenly cooling the tubes, hence the trouble. The tubes ruptured square off outside of the sheet. In another case the tubes had become choked with carbon deposits due to the use of an objectionable compound composed of a poor grade of oil and sorghum molasses; when the use of this was discontinued the trouble abated at once. The boiler manufacturers must ask the insurance men to protect them by helping to stop such bad practices.

John J. Main, Toronto, Canada, instances cases of explosions, of which he presented photographs, some of which were due to faulty material, where the steel by analysis showed too high sulphur, and some were due to both faulty material and workmanship, the boiler not being a true round and permitting constant moving away from and returning to the circular form because of a long sheet underneath and two sheets overhead. The larger number of cases he had been called upon by the Government to investigate and report upon were caused absolutely by faulty operation, mostly in the case of locomotive boilers, due to low water. The speaker thought that there are too many poor boilers made, and this demonstrates the necessity for a uniform specification to have the backing of law throughout the Dominion of Canada.

Capt. H. P. Norton, representing the Bureau of Steam Engineering, United States Navy, said that in the navy very few boiler explosions have been due to faulty material, because of rigid compliance with their own specifications; the greater proportion of accidents are due to carelessness or ignorance by attendants who have overlooked some of the regulations.

Jas. T. Foord, chief inspector, Hartford Steam Boiler Inspection Insurance Company, stated that he had come latterly more and more to the conviction that the hydrostatic test was no good when applied to the lighter grades of material, especially from 3/8 up to 3/4 in., in which cases 150 per cent. of hydrostatic pressure pretty nearly meets the elastic limit of the material. The application of such a test means strain, and he was about ready to abandon it.

John J. Main, Toronto, remarked that he thought it was all right to take the test coupon of a plate from the edge, because the edge was where the strain would ordinarily be felt, where the pressure will take place. That is the weak place, because there the hole is drilled or punched.

### Practice in Punching and Reaming

The afternoon was occupied partly by an executive session, at which certain reports of committees, &c., were read and discussed, after which the following question was presented for discussion:

**There seems to be a very wide range in engineers' ideas of what amount of metal is necessary to be taken out after a hole is punched in a plate. To remove all doubt as to the possibility of a fracture from that operation an answer to the following is suggested: Is a hole enlarged 1/8 or 1-16 in. all around sufficient? Is a hole enlarged 1/4 or 1/8 in. all around sufficient? Is a hole enlarged 3/8 or 3-16 in. all around sufficient?**

Mr. Main remarked that he knew of tests made in England some 18 or 20 years ago as to the difference between punching and reaming a hole or drilling it, which established that a 3/4 in. hole would require to be punched 1/2 in. in diameter in order to make it equal to a drilled hole, and a punched hole 3/4 in. in diameter would not stand within 20 per cent. as much as a drilled hole; but in a reamed hole, taking out 1/8 in. all around would eliminate all the damaged part of the plate, and it would then stand just as good a physical test as the drilled hole would. Any practical man, however, will admit that it depends largely upon the condition of the punch and the die. These must be absolutely sharp and clean cutting.

President Meier appointed as Committee on Uniform Specifications for the ensuing year the following: M. A. Ryan, chairman; H. D. Mackinnon, M. A. Broderick, Geo. N. Riley, A. J. Schaaf, R. E. Ashley, Dennis Wholey, T. M. Rees. Mr. Ryan, in declining appointment, moved that Col. Meier be named as chairman of the committee, and the motion was carried unanimously.

Secretary Farasey read a letter written by Capt. T. M. Rees while abroad, referring to the matter of the relative merits of the lever and the spring pop safety valve, in marine practice, in regard to which it appeared that an interesting hearing had been had before the Board of Inspectors of Steam Vessels. Capt. Rees thought that this would be an interesting topic for discussion at next year's meeting in Boston.

### ENTERTAINMENTS

An early start was made Wednesday morning in a special Pullman train for Gary, Ind., where the party was received and shown every courtesy by F. T. Bentley, traffic manager of the Illinois Steel Company, and P. W. O'Brien, and J. B. Arnold, of the sales department, while B. L. Cogshall, of the general superintendent's office acted as guide. The route taken was to the ore docks, blast furnaces, open hearth steel furnaces and rail and merchant mills. The immense establishment impressed all the party with its magnitude and importance, the most interesting feature being the great extent to which machinery had minimized human hands, and still there was work for so many human hands to do.

In the afternoon a visit was made to the plant of Joseph T. Ryerson & Son, which proved a very pleasant feature of the week's entertainment. Luncheon was served to about 160 members of the association at the Ryerson dining hall on Thursday, after which the entire party was shown through the plant. At the luncheon impromptu speeches were made by several members of the association. Souvenir "guides to Chicago" were given to the members and a box of candy to each of the ladies. The party was then taken by automobiles on a sight seeing trip to the park systems of the city.

Tuesday evening the members and ladies enjoyed a theatre party and special entertainment features were provided for the ladies.

A short session was held late Wednesday afternoon, at which the customary resolutions of thanks were adopted. The convention then adjourned *sine die*.

## THE BANQUET

The banquet at the Auditorium Hotel on Thursday night was an elaborate affair, at which Capt. James Lappan of Pittsburgh officiated as toastmaster. The speakers were as follows: Assistant Corporation Counsel Howard Hayes, Chicago; M. A. Ryan, Duluth, Minn.; Capt. Harold P. Norton, U. S. N., Washington, D. C.; John J. Main, Toronto, Canada; Gen. George Uhler, Washington, D. C.; Arthur E. Brown, Louisville, Ky.; George N. Riley, Pittsburgh, Pa.; W. H. S. Bateman, Philadelphia, Pa.; Joseph H. McNeill, Boston, Mass.; James D. Farasey, Cleveland, Ohio; Miss A. B. Chute, the only lady boiler manufacturer, Youngstown, Ohio.

The Chicago Pneumatic Tool Company, as usual on these occasions, distributed handsome souvenirs, the one this time being a pin bearing the American flag on a shield, with old Fort Dearborn in the center, as a remembrance of the visit to Chicago.

The Supplymen's Association elected officers on Thursday, as follows: W. O. Duntley, president, Chicago; J. T. Corbett, vice-president, Chicago; W. H. S. Bateman, secretary, Philadelphia, Pa.; H. B. Hare, treasurer, Cleveland, Ohio. Executive Committee: D. J. Champion, Cleveland, Ohio, chairman; Thomas Aldcorn, New York; F. B. Slocum, Brooklyn, N. Y.; C. M. Chamberlain, Chicago; R. S. Groves, Philadelphia.

The Entertainment Committee was composed of the following:

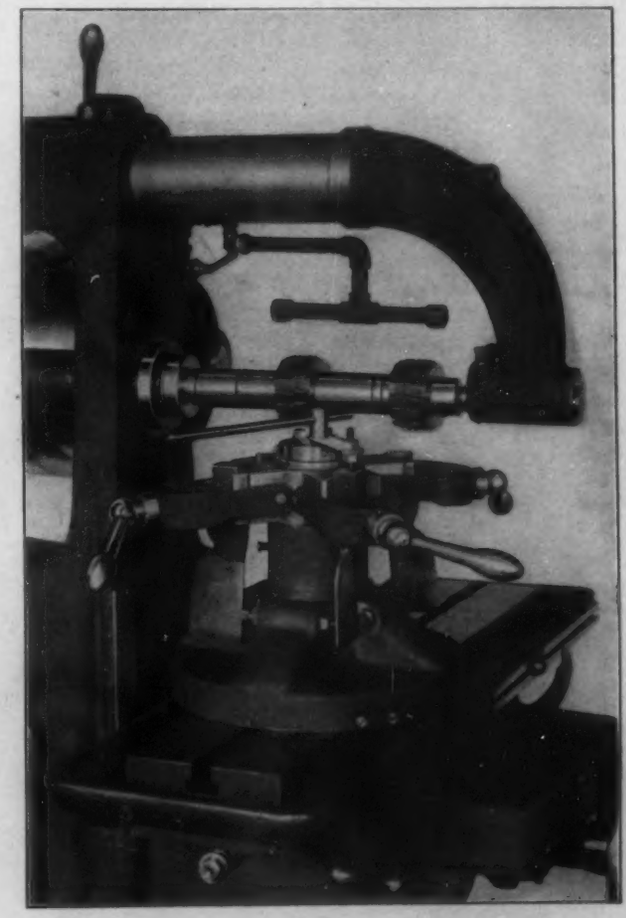
W. O. Duntley, Chicago Pneumatic Tool Company.
J. T. Corbett, Joseph T. Ryerson & Son.
W. B. Simpson, A. M. Castle & Co.
Geo. A. Rees, Chicago Pneumatic Tool Company.
Thomas Plunkett, Revere Rubber Company.
W. A. Dowler, Revere Rubber Company.
John D. Hurley, Independent Pneumatic Tool Company.
G. L. Bitting, Worth Bros. Company.
T. L. Dodd, Worth Bros. Company.
E. T. Hendee, Joseph T. Ryerson & Son.
A. M. Mueller, Joseph T. Ryerson & Son.
W. H. Dangel, Scully Steel & Iron Company.
L. M. Henoch, Scully Steel & Iron Company.
P. J. Hamler, Hamler Boiler & Tank Company.
C. K. Kroeschell, Kroeschell Bros. Company.
L. P. Mercer, Parkesburg Iron Company.
L. R. Phillips, National Tube Company.
C. M. Chamberlain, A. M. Castle & Co.
Charles Heggie, Scully Steel & Iron Company.
Joseph Mohr, John Mohr & Sons.
Albert Mohr, John Mohr & Sons.
G. S. Wood, G. S. Wood & Co.
Henry Pratt, Henry Pratt Company.
Geo. Haffner, Charles Haffner Company.
Charles Peck, Sharkey & Peck.
George Hibben, Hibben Boiler & Tank Company.
M. E. Herbert, Herbert Heater Company.
Edward Mohr, John Mohr & Sons.
C. A. Carscadin, Kirby Equipment Company.

**Heavy Steel Shells for Ore Crushing.**—The Inter Ocean Steel Company, Railway Exchange Building, Chicago; is distributing illustrated circulars showing highly creditable work done, August 15, in its recently completed plant at Chicago Heights, Ill. The work consists of steel shells to be used in crushing ore. They were made from solid ingots and are weldless. The shells measure 54 in. outside diameter and 44 in. inside diameter, are 20 in. wide across the face, have a minimum thickness of 5 in., and the shipped weight of each is 4404 lb. They were forged under a 5000-ton press and rolled in tire rolling machines. The section is stated to be the heaviest ring section ever rolled. The plant is equipped to forge and roll rings of larger diameter and width than heretofore attempted.

The West Penn Steel Company, Brackenridge, Pa., is now prepared to furnish homogeneous open hearth steel sheets, full pickled, full cold rolled, stretcher leveled, and resquared up to 48 x 144 in., and in gauges Nos. 10 to 20; also lighter gauges of these sheets in smaller sizes.

## A New Garvin Milling Machine Attachment

For general work in milling pieces which require a quartering index, the Garvin Machine Company, Spring and Varick streets, New York City, has designed a special attachment. In the accompanying engraving it is shown holding a lather's hatchet which has its head grooved at right angles thus producing a checkered face. When doing this work a piece is placed in the attachment under the hight gauge. The attachment is a four-division index fixture, having a large diameter indexing ring and a long locking bolt, which is operated by a handle on top of the attachment. After the hatchet is put in place and clamped by a binder, it is revolved through an arc of 90 degrees



A Milling Machine Attachment for Pieces Requiring a Quartering Index, Made by the Garvin Machine Company, New York City

and passed under the cutters. After passing the first cutter it is revolved another quarter revolution and goes under the other cutter, these two passes completing the squaring operation. When the attachment is loaded with four hatchets, each passage completes an operation.

The attachment is also adapted for squaring the shanks of taps, reamers, bolts, studs and work of a similar nature. When work of this kind is being done, interchangeable and easily removed half bushings are used for holding the work. In all cases it will be noticed that the cut is against the attachment and the clamp merely holds the work in place. A standard extending to the extreme top of the attachment serves as a pivot for it to swivel on, and the rotating casting fits over it in such a way that all trouble from chips is said to be entirely eliminated.

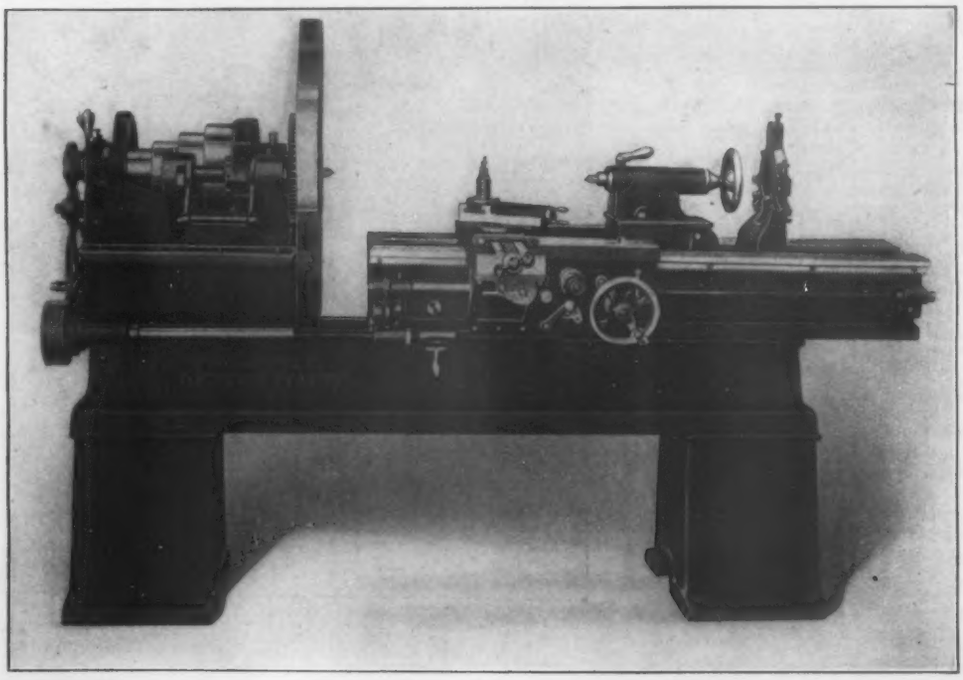
In the engraving, the attachment is shown fitted on the No. 21 back geared milling machine of its maker, which was illustrated in *The Iron Age*, May 16, 1907, but its design is such that it can be easily applied to any medium sized milling machine. The weight of the attachment is 125 lb.

## The New Fay & Scott Gap Lathe

With a view to meeting the demands of automobile garages, as well as supplying a tool for general manufacturing purposes, Fay & Scott, Dexter, Maine, have brought out the extension gap lathe shown in the accompanying illustration. The tool is known as the 14-28-in. size and in a general way the construction follows the same lines as the 24-46-in. model illustrated in *The Iron Age,* March 28, 1907, and other sizes of its builders, although it possesses a number of new features which have not been incorporated in the earlier machines.

The upper bed has power movement instead of through the hand feed screw on the back, the power being controlled by a small handle, which is shown hanging about midway of the lathe. This handle is attached to a half nut, which is lifted into mesh with the thread on the feed rod. A double bearing for the triple gear shaft has been substituted for the single one formerly employed. The bracket, supporting the overhanging carriage used in connection with the full swing diameter in the gap, is in turn supported by a second bracket which has a bearing against the apron. This is supported against the upper bed by an adjustable gib.

The lathe is equipped with a double plate apron having a bevel gear drive with reverse feeds, which are positively locked out when cutting threads. The inside front bracket of the bed is flat, giving bearings for the waist of the carriage; the back gear lever has positive locking device; the headstock is furnished with double back gears and a three-step cone pulley or is equipped with motor drive. The dimensions of the machine follow:



A New Gap Lathe, Swinging 14-28 In., Built by Fay & Scott, Dexter, Maine

| | |
|---|---|
| Swing over shear, inches | 14¼ |
| Swing over carriage, inches | 8¼ |
| Swing through gap, inches | 29 |
| Distance between closed centers, 8-ft. bed, inches | 63 |
| Distance between extended centers, 8-ft. bed, inches | 94 |
| Width of driving belt, inches | 2¼ |
| Diameter smallest cone, inches | 3⅛ |
| Diameter largest cone, inches | 8 |
| Ratio of single back gears | 10 to 1 |
| Ratio of triple back gears | 24 to 1 |
| Diameter of hole through spindle, inches | 1⅝ |
| Front head spindle bearing, inches | 2⅝ x 3¼ |
| Rear head spindle bearing, inches | 1¾ x 2¼ |
| Diameter threaded nose head spindle, inches | 2⅜ |
| Head spindle nose, U. S. threads, per inch | 8 |
| Morse taper of centers, No. | 2 |
| Tail spindle diameter, inches | 1⅝ |
| Tail spindle travel, inches | 4½ |
| Range of threads cut | 4 to 64 |
| Diameter of countershaft pulleys, inches | 10 |
| Face of countershaft pulleys, inches | 3 |
| Speed of countershaft, revolutions per minute | 210-235 |
| Angular travel of compound rest, inches | 5⅜ |
| Threads per inch on lead screw | 8 |
| Weight, 8-ft. bed, pounds | 2,000 |
| Weight per extra foot of bed, pounds | 100 |

The equipment regularly furnished with the lathe includes a double friction countershaft, plain or compound and center rests, full swing and dog driving face plates, wrenches, and a complete set of change gears. The following accessories can be furnished at a slight extra cost: Taper attachment, follow rest, friction head, double back gears, turrets fitted to carriage or bed and an oil pan.

## Abrasive Wheels in Foundries*

### Their Proper Installation and Practical Uses

BY CHARLES G. SMITH.

The first thing necessary in the successful adoption of a grinding equipment of any size is the disposition on the part of the management of the institution making the installation to operate under conditions to produce practical results.

#### Controlling Safety to the Operator

The method of controlling the factor of safety to the operator should be determined; whether by safety collars, which are tapered if possible on the concave side ¾ in. to the foot, so that the wheels may be tapered convexly accordingly (in this case, where the nature of the work will permit, the maximum amount of wheel exposed beyond the edge or rim of these collars should be 2 in. and the collars changed as the wheels wear), or by use of substantial hoods in cases where it is necessary to use wheels with straight sides, owing to the nature of work to be ground, or by using both hoods and collars.

Where possible, the general results will be more satisfactory where the safety collars are used; and should a wheel break in service, these collars (which should be at least ¾ in. thick and made from steel castings for wheels 24 in. in diameter) will hold the pieces together. Unless it is necessary to have more than 2 in. of the wheel exposed beyond the rim of the collars, there are extremely few exceptions where a piece of wheel is liable to break away from outside of the collar, and the piece would be so small that it would cause no serious injury to the operator.

After determining a wheel of a certain size and face which is to be used, it is necessary to have machines solidly set on good foundations with a heavy spindle in long bearings that can be kept well lubricated, having all vibration eliminated, when carrying the load of the wheels with the additional weight of the heaviest safety collars that are to be used with them. For a 24 x 2 in. wheel with these safety collars the spindle should be at least 2¾ in. between the flanges

* From a paper read, October 3, before the Pittsburgh Foundrymen's Association. The author is president of the Pittsburgh Emery Wheel Company.

where the wheel is mounted and for 24 in. wheels heavier than this, the spindle should be at least 2½ in. diameter with bearings not less than 12 in. long. This applies to floor stands for foundry practice, especially where the work is of the heavier nature.

In all steel foundries, excepting crucible plants where nothing but very small castings are made, and many malleable iron foundries where there is sufficient work of a heavy nature, the most economical machines that can be installed are swing frame grinders, and great care should be had in the installation of these machines, as the writer has seen many of them installed that did not produce practical results because of the installation of a machine entirely too light and without sufficient power and not run under proper speed conditions. These machines should be driven with flat belts, having a spindle at least 2 in. in diameter where the wheel is mounted and carrying an 18, 20 or 24 in. wheel, and the wheel spindle driven by at least a 4 in. double belt. These machines have not proved economical in iron foundries.

### Ample Power Should Be Provided

After investing in such an equipment as mentioned above, there should be ample power driving these machines to keep the wheel operating under the proper speed while it is at its highest pressure of service. On the floor stand operating two 24 in. wheels, where two strong men are working, there should be at least 10 hp. and on a swing frame grinder operating one 20 in. wheel of 2 or 2½ in. face, if driven by belt power, the countershaft should be driven by a 6 in. belt, as there are many cases in the foundries where the driving belt from the line shaft to the countershaft is comparatively short to enable the wheel arm to project under the crane, so as to make possible the placing of castings by the crane under the wheel.

In operating one of these machines with a motor connected to the countershaft, which must drive the belts and absorb the friction necessary, not less than a 7½ hp. motor should be used, preferably a 10 hp., but where the motor is mounted on a bracket at the elbow of this machine, the belt being connected directly from the motor pulley to the pulley on the wheel head, a 7½ hp. motor is ample and in some cases 5 hp. has proved entirely satisfactory, in which cases an alternating current motor has been used. This will enable the operator to remove fins, gates and pads very rapidly, and the stronger the man the faster his record.

The adoption of the safety collars has brought about this economical condition more than any other factor, in that it has enabled the adoption of speeds which bring results with safety. The practical safe limit for running abrasive wheels with straight sides is 5000 ft. per min. peripheral speed, and even then it is quite hazardous, and unless these wheels are carefully protected with hoods it is really criminal for any one who is operating either a large or fair sized grinding equipment to attempt the adoption of wheels with straight sides. With the safety collars as described above, properly used, it is more safe to operate at 6500 ft. per min. than to operate the straight wheels at 5000 ft., with the additional advantage that the same wheel on the same material will produce practically 170 per cent. in general results of what can be secured from the same wheel at 5000 ft.

Any one operating in accordance with all of the above stipulations will secure the highest degree of efficiency obtainable in foundry work, and the writer's experience has been that 6500 ft. has proved to be the most economical speed at which to run. As this speed is approached the conditions improve and so far as it is surpassed conditions appear to retard, and this speed is also very safe as the percentage of wheels that break which are made by the manufacturers of good wheels is very small.

### Cup or Tub Wheels to Be Avoided

The use of cup wheels or, as sometimes called, tub wheels, should at all times be avoided, as this is the most dangerous practice in the abrasive line, and in their stead, where it is necessary to do face grinding, a good substantial chuck should be used, with a cylinder wheel which has no back. It is apparent that with a cup or tub wheel which, for instance, may be 12 in. in diameter, 6 in. high, with a 2 in. or more thickness of rim, and a back 1 or 1½ in. thick, the centrifugal strain of this heavy rim pulling on this much lighter binding point, which is but 1½ in. thick at the spindle, compels the running of these wheels very slowly to keep within any reasonable lines of safety whatever; whereas, were this wheel made without the back and the cylinder completely surrounded with an adjustable chuck, whereby the wheel can be fed forward as worn, a higher speed can be maintained with perfect safety. A cup wheel should not be run more than 3500 or 3800 ft. per min., depending on the thickness of the rim, whereas a ring wheel may be run approximately 5000 ft. per min.

### Where Natural and Where Artificial Abrasives Seem Preferable

Open hearth converter, manganese and crucible steel castings, as well as other forms of steel products, such as forgings, etc., also malleable iron, after it has been annealed, are ground much faster and more economically with the natural abrasives, either in the emery or corundum or a combination of the two in various percentages, and it is necessary to be thoroughly acquainted with the local conditions, such as the percentages of carbon, manganese, etc., and the general conditions under which the wheels run, in order to secure the proper wheel in the necessary proportions and sizes of the abrasive grain, and their relative proportions to the ingredients of the bond, as there are many factors to be considered in determining this point, too many for consideration at this time.

Gray iron castings, also those made in hard white iron, before annealing, and from brass, may be ground to better advantage by the artificial abrasives, principally carborundum. There are cases in chilled work where both alundum and carborundum have given very satisfactory results, and in some cases in castings such as stove plate, the adamite, also adamite mixed with corundum, have proved very satisfactory, and in such cases as the grinding of manganese, safe and vault doors, and door frames, where the work is operated purely by machine feeding, the alundum appears to have given better service up to date.

There are many details in this practice that cannot be covered in a document short enough to be of interest to you in one evening. Some of these details are as follows: The difference in the international and external grinding of hard castings, either with very high carbon or with high manganese; grinding of car wheels, either chilled iron or steel; grinding of frogs and switches and other surface work, all of which must be done in power-fed machines. The reason why some of these are successful grinding propositions and others are not. Toolroom work and the differences between the requirements of hand and machine grinding.

Then there come such other topics as the grinding of edge tools, plows, automobile crankshafts, guide bars and other types of edge or face work, each of which has its specific details.

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European advices state that American shipbuilding companies are not likely to bid for the construction of the two battleships proposed for the Chilean navy, as, despite representations by American and German interests, the Chileans, have not altered the original specifications, which favor British builders in calling for certain equipment of British manufacture. The bids will be opened October 30.

# The New Haven Sand-Blast Tumbling Barrel

## A New Self-Contained Device for Cleaning Small Castings and Forgings Rapidly

The sand-blast barrel shown in the engravings built by the New Haven Sand-Blast Company, New Haven, Conn., contains new principles for this type of machine. Its inventor, C. A. Dreisbach, has developed a self-contained barrel in which sand or steel shot is used over and over again without leaving the barrel, being returned automatically to the hopper. The nozzles, either four to six in number, are set in a line parallel to the axis of the barrel and consequently the work as it is tumbled cannot escape the blast. The barrel is 36 in. in diameter and 4 ft. long, inside dimensions. Air pressure may be applied according to the work required. Fig. 1 shows the front of the machine with the door and its hinge and trunnion locking mechanism. Fig. 2 is a rear view with the drive, the support of the head and the expansion chamber. Fig. 3 reveals the interior of the barrel with its hopper and nozzles. Fig. 4 is a photograph of a few styles of castings done by the barrel before and after cleaning.

The barrel is mounted on rolls driven through bevel gears from a clutch pulley shaft at the rate of 3 rev. per min. which reduces the breakage of castings to the smallest degree possible. The head at the rear, mounted on heavy cross bars, is stationary and carries the hopper, nozzles and exhausts. The door revolves with the barrel, being mounted on a trunnion carried by the hinge. The barrel consists of two cylindrical chambers one within the other and fastened together. The inner barrel which is interchangeable is made up of steel plates perforated at frequent intervals and may be replaced when worn. These perforations are clearly visible in Fig. 3.

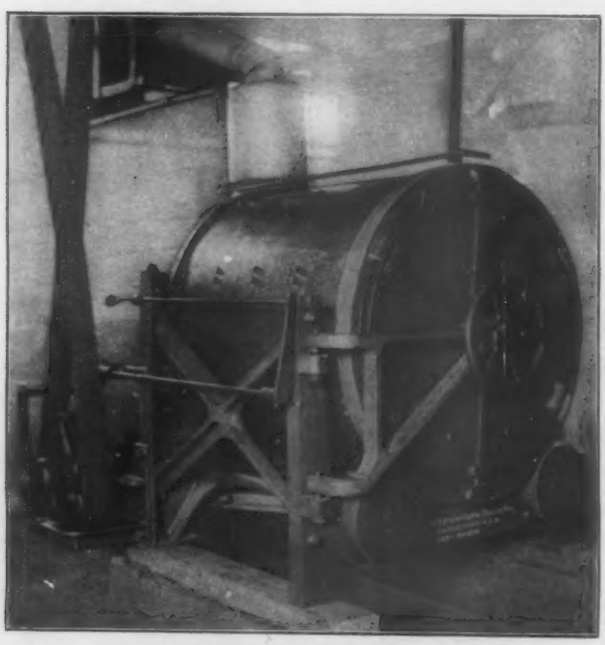

Fig. 1.—The New Sand Blast Tumbling Barrel, Built by the New Haven Sand Blast Company, New Haven, Conn.

The exterior barrel has eight longitudinal buckets extending its entire length. The sand or shot delivered by the blast, after doing its work, passes by gravity through the perforations at the bottom of the chamber and is caught in the buckets and carried to the top of the barrel, and is delivered also by gravitation through the same perforations to the hopper in the inner barrel, where it is screened and made ready for use again. The dust is carried away by an exhaust passing through an expansion chamber which acts as a separator; any usable particles are removed from the air and returned by gravity to the barrel. A lining ring closes the joints between the barrel and the stationary head. The door fits tightly, being held in position by a series of bolts locked or unlocked by a quarter turn of a small wheel on the door. In consequence the barrel is dust proof. The door being sustained by a hinge brings no weight upon the operator as he opens or closes it. All control of the machine is from the front through levers, one of which operates the driving clutch, another regulates the sand, and the third the air.

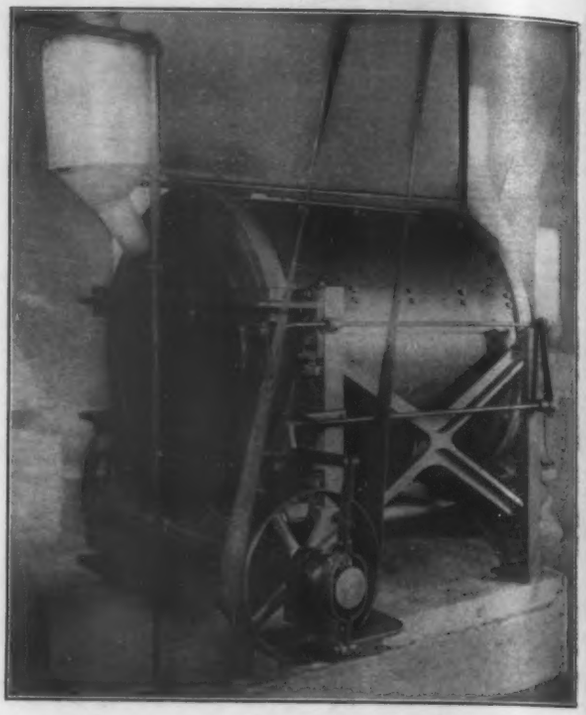

Fig. 2.—Rear View of the Barrel, Showing Drive, Support for Hood and Expansion Chamber.

The barrel is set up from the floor so that it may be unloaded into a wheelbarrow with a minimum of effort. The castings, forgings, or other work are placed in the barrel in the usual way and the steel shot or sand is thrown in at random reaching the hopper by the buckets. Where sand is used it is not necessary to place sand in the barrel with each lot of castings, one charge of sand cleaning six or seven charges of castings. As steel shot does not wear down as quickly as sand, one charge in the barrel lasts indefinitely. The nozzles constitute the only parts which need re-

Fig. 3.—Interior of the Barrel, Showing Hopper, Nozzles and Perforations.

placing. They are inexpensive, being made from rough castings, either of malleable or chilled gray iron, and snap in and out of place easily.

Fig. 4 shows a number of pieces before and after cleaning in the barrel. A and B show two castings before cleaning and C D and E similar castings after they have been sand blasted. In one charge of the barrel 71 pieces such as these of gray iron weighing

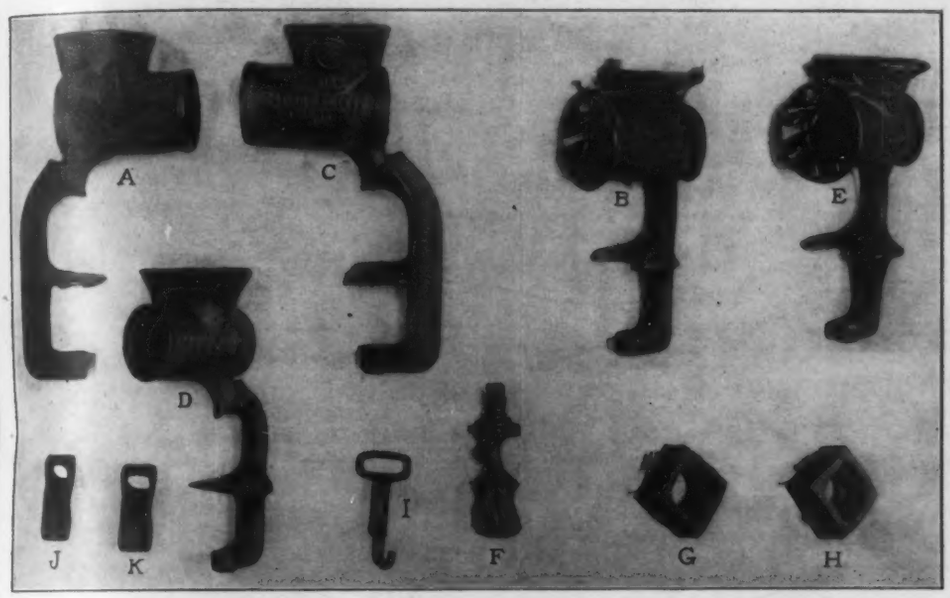


Fig. 4.—Specimen Pieces Cleaned in the Barrel.

altogether 153 lb. have been cleaned in 5 min. F shows another cleaned casting which is of gray iron and 423 lb. of these have been cleaned at one charge in 20 min. G and H show another form of casting before and after cleaning. This is malleable iron and 410 lb. were cleaned in one charge in 20 min. I shows a cleaned casting of which 300 lb. were blasted in 15 min., which also is malleable iron. J and K represent another piece before and after cleaning. This is malleable iron and 400 lb. were cleaned in 15 min. in one charge.

## The Nuttall Company's Street Railway Exhibit

The R. D. Nuttall Company, Pittsburgh, Pa., had a very interesting exhibit last week at the convention of the American Street and Interurban Railway Association, Atlantic City, N. J. The exhibit extended through from the main building to a section of Machinery Hall, with a reception space in the Main Building and a display of apparatus in Machinery Hall.

A pneumatic pantograph trolley of its latest type, for service where conditions provide low clearance, was shown in operation. This is used on the New York Central lines. Ball bearing bases, types Nos. 11, 13 and 14, for interurban railway service, were also shown, as well as air compressor gears and pinions, street railway gears and pinions, and automobile transmission apparatus. Another interesting feature of the exhibit was furnished by the butt welded, reinforced trolley poles. These combine strength and resiliency, being built so as to withstand much abuse. When bent they can be straightened out cold, and put into good condition for service. Seamless trolley poles were also shown.

The following representatives of the company were in attendance during the convention: F. A. Estep, president; Milton Rupert, assistant to president; J. S. Monroe, Cincinnati; G. A. Martin, Pittsburgh; G. E. Watts, Atlanta; S. K. Colby, San Francisco, and G. W. Provost, T. S. Cluly, W. J. Armstrong, A. H. Englam, J. E. Titus, J. W. Porter, Max Berg, E. R. Mason, all of Pittsburgh.

## The Philadelphia Foundry Foremen

The first monthly meeting since the summer recess of the Associated Foundry Foremen of Philadelphia and Vicinity was held at its headquarters in the Odd Fellows' Temple, Philadelphia, Pa., on the evening of October 11. President C. R. Brown was in the chair. After a brief address by that officer, routine business was transacted and reports of various committees were received, the most important being that of the Entertainment Committee in connection with the recent banquet so successfully given by the association. Applications for membership were favorably acted upon as follows: For active membership, John Butterworth, Penn Steel Castings & Machine Company, and Thomas F. Brown, Chester Steel Castings Company, both of Chester, Pa. For associate membership, William Elton, J. W. Paxson Company, and Edward Walsh, Richard Walsh & Sons, both of Philadelphia, and Charles M. Goldman, Philadelphia representative of the S. Obermayer Company, Cincinnati.

Nominations for officers for the ensuing year were made as follows: For president, Clarence R. Brown, E. E. Brown & Co., renominated; for vice-president, Joseph Whitehead, Abram Cox Stove Company; for treasurer, George M. Benkert, Fairmount Foundry Company, renominated; for secretary, D. M. Kittenger, Pencoyd Iron Works, renominated. The election will be held at the November meeting. Following the appointment of Thomas Smith, A. J. Wallace and Joseph Whitehead as Auditing Committee, a paper prepared by Abram C. Mott, president of the Abram Cox Stove Company, Philadelphia, on "The Ideal Foundry Foreman," was read by Joseph Whitehead. A general discussion ensued.

**The American Shipbuilding Company's Annual Meeting.**—Stockholders of the American Shipbuilding Company held their annual meeting at 15 Exchange Place, Jersey City, October 13. They re-elected the old Board of Directors and the directors re-elected President James C. Wallace and the old officers of the company. Gross earnings for the year ending June 30, 1910, were $1,980,654. Deducting for dividends of 7 per cent. on the preferred stock and 4 per cent. on the common, cost of maintenance and the rebuilding of docks, the net earnings were $834,322. In the previous year the gross earnings were $1,257,722, no dividend was paid on the common stock, and the net earnings were $325,078. The company's surplus June 30, 1910, was $7,003,974.

Referring to reports that the Youngstown Sheet & Tube Company, Youngstown, Ohio, would shortly start work on the building of an open hearth steel plant to contain six 50-ton furnaces, the official statement is made that it is not having plans prepared for any additions at this time. It is probable that in the course of a year the company may commence work on an open hearth plant, but as yet no definite action has been taken.

# CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

## IRON AND STEEL—

### Bar Iron from store—

Refined Iron:

| | |
|---|---|
| 1 to 1¾ in. round and square; 1½ to 4 in. x ⅜ to 1 in. | ₩ lb 1.90¢ |
| 1½ to 4 in. x ¼ to 5-16 | ₩ lb 2.10¢ |
| Rods—¾ and 11-16 round and square | ₩ lb 2.10¢ |

| Angles: | Cts ₩ lb |
|---|---|
| 3 in. x ¼ in. and larger | 2.10¢ |
| 3 in. x 5-16 in. and ⅜ in. | 2.35¢ |
| 1½ to 2½ in. x ¼ in. | 2.20¢ |
| 1½ to 2¾ in. x 3-16 in. and thicker | 2.10¢ |
| 1 to 1¾ in. x 3-16 in. | 2.20¢ |
| 1 to 1¾ x ⅛ in. | 2.30¢ |
| ⅜ x ⅛ in. | 2.40¢ |
| ½ x ⅛ in. | 2.50¢ |
| ⅝ x ⅛ in. | 3.55¢ |
| ⅝ x 3-32 in. | 4.35¢ |

Tees:

| | |
|---|---|
| 1 in. | 2.65¢ |
| 1¼ in. | 2.45¢ |
| 1½ to 2½ x ¼ in. | 2.15¢ |
| 1½ to 2½ x 3-16 in. | 2.25¢ |
| 3 in. and larger | 2.15¢ |
| Beams | 2.10¢ |
| Channels, 3 in. and larger | 2.10¢ |
| Bands—1½ to 6 x 3-16 to No. 8 | 2.30¢ |
| "Burden's Best" Iron, base price | 3.15¢ |
| Burden's "H. B. & S." Iron, base price | 2.95¢ |
| Norway Bars | 3.00¢ |

### Merchant Steel from Store—

| | per lb |
|---|---|
| Bessemer Machinery | 1.90¢ |
| Toe Calk, Tire and Sleigh Shoe | 2.50@3.00¢ |
| Best Cast Steel, base price in small lots | 7¢ |

### Sheets from Store—

Black

| | One Pass, C.R Soft Steel. | R. G. Cleaned. |
|---|---|---|
| No. 16 | ₩ lb 2.55¢ | 2.80¢ |
| Nos. 18 to 20 | ₩ lb 2.70¢ | 2.90¢ |
| Nos. 22 and 24 | ₩ lb 2.75¢ | 3.00¢ |
| No. 26 | ₩ lb 2.80¢ | 3.10¢ |
| No. 28 | ₩ lb 2.90¢ | 3.30¢ |

### Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 12 @14½

Patent Planished, W. Dewees Wood, ₩ lb A, 10¢; B, 9¢ net.

### Galvanized.

| | |
|---|---|
| Nos. 12 and 14 | ₩ lb 2.95¢ |
| Nos. 22 to 24 | ₩ lb 3.30¢ |
| No. 26 | ₩ lb 3.50¢ |
| No. 28 | ₩ lb 3.80¢ |

No. 20 and lighter 36 inches wide, 25¢ higher.

### Genuine Iron Sheets—

Galvanized.

| | |
|---|---|
| Nos. 22 and 24 | ₩ lb 5.75¢ |
| No. 26 | ₩ lb 6.25¢ |
| No. 28 | ₩ lb 7.25¢ |

### Corrugated Roofing—

| 2½ in. corrugated. | Painted | Galvd |
|---|---|---|
| No. 24 | ₩ 100 sq. ft. $3.85 | 4.80 |
| No. 26 | ₩ 100 sq. ft. 2.95 | 4.00 |
| No. 28 | ₩ 100 sq. ft. 2.60 | 3.75 |

### Tin Plates—

American Charcoal Plates (per box.)

| | |
|---|---|
| "A.A.A." Charcoal: | |
| IC, 14 x 20 | $6.35 |
| IX, 14 x 20 | 7.90 |
| A. Charcoal: | |
| IC, 14 x 20 | 6.40 |
| IX, 14 x 20 | 8.50 |

American Coke Plates—Bessemer—

| | |
|---|---|
| IC, 14 x 20, 107 lb | $4.40 |
| IX, 14 x 20 | 5.40 |

American Terne Plates—

| | |
|---|---|
| IC, 20 x 28 with an 8 lb. coating | $8.70 |
| IX, 20 x 28 with an 8 lb. coating | 10.50 |

### Seamless Brass Tubes—

List November 13, 1908. Base price 18¢

### Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

### Copper Tubes—

List November 13, 1908. Base price 21¢

### Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ lb

### High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

### Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₩ lb

### Brass Wire—

List August 1, 1908. 14¼¢ ₩ lb

### Copper Wire—

Base Price. Carload lots mill 14 ¢

### Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

## METALS—

### Tin—

Straits Pig ₩ lb 37 @37½

### Copper—

| | |
|---|---|
| Lake Ingot | ₩ lb 14⅝@15 |
| Electrolytic | ₩ lb 14¼@14⅝ |
| Casting | ₩ lb 14¼@14⅝ |

### Spelter—

Western ₩ lb 6¼@6½

### Zinc.

No 9, base, casks ₩ lb 6 ¢ | Open ₩ lb 6½

### Lead.

| | |
|---|---|
| American Pig | ₩ lb 5 @5¼ |
| Bar | ₩ lb 6@6½ |

### Solder.

| | |
|---|---|
| ½ & ½, guaranteed | ₩ lb 22½@23 |
| No. 1 | ₩ lb 20½@21 |
| Refined | ₩ lb 18½@19 |

Prices of Solder indicated by private brand vary according to composition.

### Antimony—

| | |
|---|---|
| Cookson | ₩ lb .@8¼ |
| Hallett's | .@8¼ |
| Other Brands | .@8¼ |

### Bismuth—

Per lb $2.00@2.25

### Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting .@

Rods & Wire Base Price 3

Sheets Base Price 3

### Old Metals.

*Dealers' Purchasing Prices Paid in New York*

| | Cents— |
|---|---|
| Copper, Heavy cut and crucible | ₩ lb 10.75@11 |
| Copper, Heavy and Wire | ₩ lb 10.50@10.75 |
| Copper, Light and Bottoms | ₩ lb 9.50@9.75 |
| Brass, Heavy | ₩ lb 7.25@7.50 |
| Brass, Light | ₩ lb 5.75@6.00 |
| Heavy Machine Composition | ₩ lb 9.50@9.75 |
| Clean Brass Turnings | ₩ lb 7.00@7.25 |
| Composition Turnings | ₩ lb 8.25@8.50 |
| Lead, Heavy | ₩ lb .@3.50 |
| Lead, Tea | ₩ lb .@3.25 |
| Zinc Scrap | ₩ lb .@3.75 |


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